

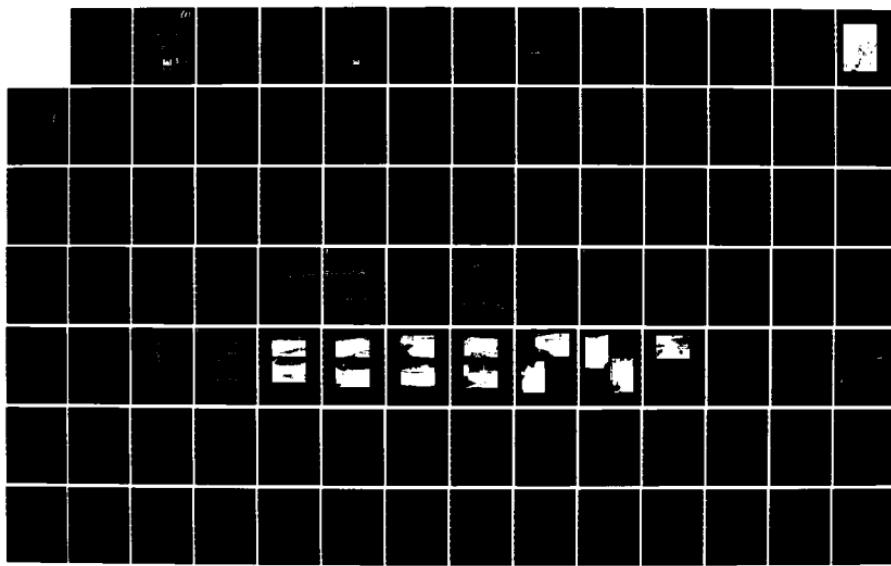
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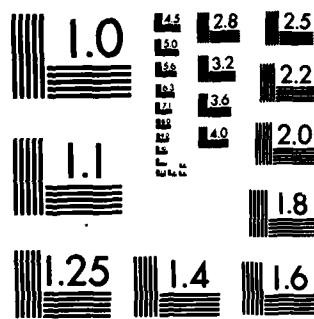
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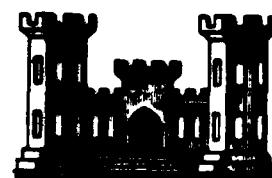
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QUINEBAUG RIVER BASIN  
KILLINGLY, CONNECTICUT

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ACME POND DAM  
CT 00172

PHASE 1 INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM



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JUL 25 1984  
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DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
WALTHAM, MASS.

MARCH 1981

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REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER  CT 00172	2. GOVT ACCESSION NO.  <i>A143310</i>	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle)  Acme Pond Dam	5. TYPE OF REPORT & PERIOD COVERED  INSPECTION REPORT	
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7. AUTHOR(s)  U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION	8. CONTRACT OR GRANT NUMBER(s)	
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11. CONTROLLING OFFICE NAME AND ADDRESS  DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254	12. REPORT DATE  March 1981	
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number)  DAMS, INSPECTION, DAM SAFETY,  Quinebaug River Basin Killingly, Conn. Acme Pond Dam		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number)  The dam at Acme Pond is an earth embankment structure with a vertical downstream stone masonry wall. Its maximum height above the trail race channel to the mill, at the spillway, is 18.7 ft. As a result of the visual inspection and hydraulic and hydrologic calculations, the dam is considered to be in FAIR condition. The test flood for this dam, classified as SMALL and as having a HIGH hazard potential is half the Probable Maximum Flood.		



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
424 TRAPELO ROAD  
WALTHAM, MASSACHUSETTS 02254

REPLY TO  
ATTENTION OF:  
NEDED

JUN 10 1981

Honorable William A. O'Neill  
Governor of the State of Connecticut  
State Capitol  
Hartford, Connecticut 06115

Dear Governor O'Neill:

Inclosed is a copy of the Acme Pond Dam (CT-00172) Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, National Patent Development Corporation, Acme-Chaston Division, 3 Huntington Quadrangle, Suite 2 and 11, Malvern, New York 11746.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely,

C. E. EDGAR, III  
Colonel, Corps of Engineers  
Commander and Division Engineer

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**QUINEBAUG RIVER BASIN  
KILLINGLY, CONNECTICUT**



**ACME POND DAM  
CT 00172**

**PHASE 1 INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM**



**DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
WALTHAM, MASS.**

**MARCH 1981**

NATIONAL DAM INSPECTION PROGRAM

PHASE I - INSPECTION REPORT

Identification No.: CT 00172  
Name of Dam: Acme Pond Dam  
Town: Killingly  
County and State: Windham, Connecticut  
Stream: Whetstone Brook  
Owner: Acme Chaston Division  
National Patent Development Corp.  
Date of Inspection: 13 November 1980

BRIEF ASSESSMENT

The dam at Acme Pond is an earth embankment structure with a vertical downstream stone masonry wall. It is 12 feet wide at the crest, 570 feet long, and 10 feet high above the roadway which runs along the entire toe of the downstream side of the dam. Its maximum height above the tail race channel to the mill, at the spillway, is 18.7 feet. This channel passes beneath the roadway and the mill, and then exits into a small mill pond about 200 feet downstream of Acme Pond Dam. The stone masonry spillway, located near the right abutment of the dam, is a broad crest weir 16 feet long and 3.2 feet high. On the upstream side of the dam is an intake structure for a 16 inch pipe which passes beneath the dam and road. This pipe is laid within an older 4 foot diameter steel plate pipe and provides water for a storage tank at the mill. The pipe has a valve beneath the mill building which can discharge into a second channel passing beneath the mill, to join the one previously mentioned. Older gate mechanisms may be found near the spillway structure, but they are in a state of disrepair and not considered functional.

The dam is located on Whetstone Brook and is at the outflow point of a 5.2 square mile watershed which contains 5 other reservoirs. Together, these reservoirs provide substantial storage capacity to dampen the effect of major flooding. The storage capacity of Acme Pond at the top of the dam is 29 acre feet.

The dam was probably constructed in 1846 to provide mechanical power for a mill manufacturing cotton cloth products. Since that time only minor repairs have been instituted, and from local information, the dam appears not to have been overtopped.

As a result of the visual inspection and hydraulic and hydrologic calculations, the dam is considered to be in FAIR condition. To assure the long term performance of this structure, several items will require further attention. These items concern themselves with the downstream masonry wall, which has tilted and is bulging at many locations, indicating potential future instability; the crest of the dam, which has settled near the left abutment; and the capacity of the spillway and the downstream channel, which are inadequate to pass the test flood outflows, particularly beneath the mill structure.

The test flood for this dam, classified as SMALL and as having a HIGH hazard potential, is half the Probable Maximum Flood ( $\frac{1}{2}$  PMF). This test flood has an inflow of 1,670 cfs and an outflow discharge of 1,660 cfs, and will overtop the dam by 1 foot. The maximum outflow capacity of the spillway at the top of the dam is 250 cfs, which represents approximately 15% of the test flood outflow.

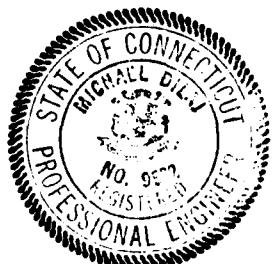
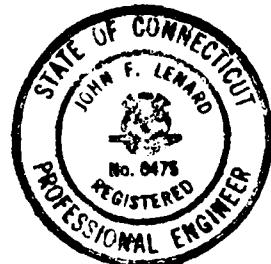
It is recommended that the Owner retain the services of a registered professional engineer to perform the tasks outlined in Section 7 of this report, which include a structural analysis and a more in depth hydraulic and hydrologic study. These recommendations and any further remedial measures should be implemented within one year of the Owner's receipt of this report.

LENARD & DILAJ ENGINEERING, INC.

By:

John F. Lenard  
John F. Lenard, P.E.  
President

Michael Dilaj  
Michael Dilaj, P.E., Vice President  
Project Manager



This Phase I Inspection Report on Acme Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgement and practice, and is hereby submitted for approval.

Carney M. Terzian

CARNEY M. TERZIAN, MEMBER  
Design Branch  
Engineering Division

Joe Finegan

JOSEPH W. FINEGAN, JR., MEMBER  
Water Control Branch  
Engineering Division

Armand Martesian

ARAMAST MARTESIAN, CHAIRMAN  
Geotechnical Engineering Branch  
Engineering Division

APPROVAL RECOMMENDED:

Joe B. Fryar

JOE B. FRYAR  
Chief, Engineering Division

## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation. However, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions will be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the spillway test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and downstream damage potential.

The Phase I Investigation does not include an assessment of the need for fences, gates, no-trespassing signs, repairs to existing fences and railings and other items which may be needed to minimize trespass and provide greater security for the facility and safety to the public. An evaluation of the project for compliance with OSHA rules and regulations is also excluded.

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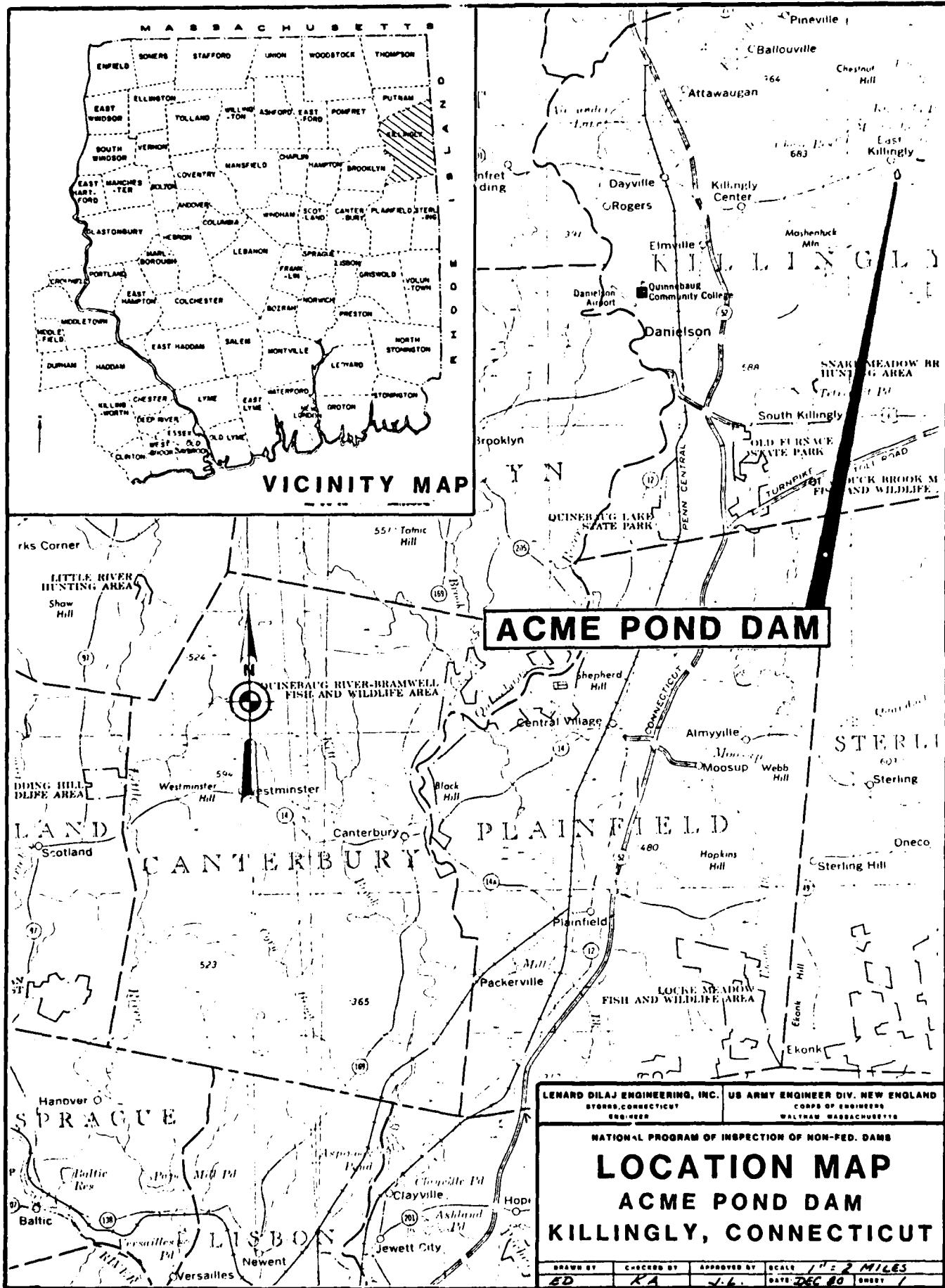
**APPENDIX E - INFORMATION AS CONTAINED IN THE NATIONAL  
INVENTORY OF DAMS**



OVERVIEW PHOTO

TAKEN 15 DEC. 1980

US ARMY ENGINEER DIV. NEW ENGLAND U.S. ARMY CORPS OF ENGINEERS WATERWAY ENGINEERING LEONARD DAU ENGINEERING, INC. STAMFORD, CONNECTICUT END PAGE	NATIONAL PROGRAM OF INSPECTION OF NCN-FED. DAMS	ACME POND DAM KILLINGLY, CONNECTICUT CT 06172 JAN. 1981
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## PHASE I INSPECTION REPORT

### SECTION I - PROJECT INFORMATION

#### 1.1 General:

- a. Authority: Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Lenard & Dilaj Engineering, Inc. has been retained by the New England Division to inspect and report on selected dams in the States of Connecticut and Rhode Island. Authorization and notice to proceed were issued to Lenard & Dilaj Engineering, Inc. under a letter of 6 November, 1980 from William E. Hodgson, Jr., Colonel, Corps of Engineers. Contract No. DACW33-81-C-0014 has been assigned by the Corps of Engineers for this work.
- b. Purpose of Inspection Program: The purposes of the program are to:
  1. Perform technical inspection and evaluation of non-federal dams to identify conditions requiring correction in a timely manner by non-federal interest.
  2. Encourage and prepare the states to quickly initiate effective dam inspection programs for non-federal dams.
  3. To update, verify and complete the National Inventory of Dams.
- c. Scope of Inspection Program: The scope of this Phase I inspection report includes:
  1. Gathering, reviewing and presenting all available data as can be obtained from the owners, previous owners, the state and other associated parties.
  2. A field inspection of the facility detailing the visual condition of the dam, embankments and appurtenant structures.

3. Computations concerning the hydraulics and hydrology of the facility and its relationship to the calculated flood through the existing spillway.
4. An assessment of the condition of the facility and corrective measures required.

It should be noted that this report does not pass judgment on the safety or stability of the dam other than on a visual basis. The inspection is to identify those features of the dam which need corrective action and/or further study.

#### 1.2 Description of Project:

- a. Location: The project is located on Whetstone Brook (a tributary to the Quinebaug River), in the Town of Killingly, County of Windham, and State of Connecticut. The dam is located approximately 1,000 feet south of State Route #101, and is shown on the East Killingly, Conn.-R.I. USGS quadrangle map, having coordinates  $41^{\circ} 50' 48''$  (north latitude) and  $71^{\circ} 49' 08''$  (west longitude).
- b. Description of Dam and Appurtenances: Acme Pond Dam is an earth embankment dam with a downstream stone masonry wall. It is approximately 500 feet long and 10 feet high, with an average crest width of 12 feet. The downstream wall is the full height of the dam in the vicinity of the spillway and outlet structure, and it is about 7 feet lower than the dam elsewhere. The upstream slope of the dam is very irregular with an inclination of about 1.5H:1.0V. There is partial riprap protection consisting of large stones 1 to 2 feet in size. In many areas, however, there is no riprap at all. Near the right abutment, between the spillway and the outlet structure, there is an upstream stone wall which has collapsed in some areas.

The spillway is located near the right abutment and consists of a cut stone masonry wall with cut stone masonry training walls. The spillway flow passes under Bailey Hill Road through a rectangular stone culvert with an arch at the entrance and then continues beneath the mill to exit on the northwest side of the building.

The outlet works consists of a concrete intake structure and a 16" cast iron pipe installed within a 4' diameter steel plate pipe culvert. The 16" pipe was installed to provide fire protection and limited process water (bleaching) for the plant. A centrifugal pump lifts the water into the water tower which in turn provides the pressure for the fire protection system. Water is withdrawn from the pond only at times when the storage tank needs refilling. Otherwise the flow passes over the spillway. The 16" line ends at a gate valve located beneath the mill, at which point it can discharge into a channel, also passing beneath the building, to join the channel previously mentioned. The flow discharges into a small pond named Mill Pond 50 feet downstream of the structure. This pond is created by a second dam immediately downstream of the mill.

An old outlet works is located at the present spillway structure. It is in a state of disrepair, however, and not considered functional. Its effect on additional future discharge capacity is considered negligible.

- c. Size Classification: SMALL - With the pool level at the top of the dam, the impoundment capacity is 29 acre feet. The dam's height above the road which runs along the toe is 10 feet. It is therefore classified as a SMALL structure, in accordance with the recommended guidelines of the Corps of Engineers.
- d. Hazard Classification: HIGH - The dam is classified as having a HIGH hazard potential because it is located in an area where the failure discharge could cause a possible loss of more than a few lives and appreciable damage to property. The breach of the dam could cause significant damage to Bailey Hill Road and to the manufacturing facilities located just opposite the dam, which include a large building and a water storage tank.
- e. Ownership: Acme Pond Dam is owned by the National Patent Development Corporation, Acme-Chaston Division, with executive offices at 3 Huntington Quadrange, Suite 2 and 11, Malvern, New York 11746.
- f. Operator: The operating personnel of the above company are under the supervision of Joseph Skrypczak,

Technical Supervisor, Lake Road, Box 419, Dayville,  
Connecticut 06241, telephone (203) 774-8541.

- g. Purpose of Dam: The dam at Acme Pond was constructed for mechanical power generation. Since the discontinuation of mechanical power generation, the purpose of the dam is only to provide a water supply for fire protection at the mill.
- h. Design and Construction History: Acme Pond Dam was probably built in 1846 at the same time the first manufacturing structure was erected across the street. A more detailed history of the mill and dam has been included in the Appendix. There were considerable alterations to the power generating equipment in 1872 when turbines were installed in place of the "wooden breast wheels". During 1945 the 16" discharge pipe and the fire protection system were installed.
- i. Normal Operating Procedures: Water is normally maintained at spillway elevation and discharged through the spillway into the tailrace which passes beneath the mill and in turn discharges into Mill Pond. There are 2 centrifugal pumps in the basement of the mill building which draw from the 16" pipe installed into the old outlet works culvert. These pumps are regulated by the water level in the elevated storage tank. The only means of lowering the reservoir is through this 16" pipeline which is normally kept closed by a gate valve and opened only on an intermittent basis. This gate valve is located at the discharge point of the pipe (which is always under pressure). Water for the storage tank is drawn from the pressure section of the pipe before the gate valve. There is another old intake structure located immediately left of the spillway which discharges just downstream of the spillway wall. This old wooden gate structure is presently inoperable.

#### 1.3 Pertinent Data:

- a. Drainage Area: Acme Pond and its drainage area are located in Windham County in the northeastern portion of Connecticut. The basin is generally oval in shape with a longitudinal axis of approximately 3 miles and a width of 2 miles. The total drainage area is 5.16 square miles in size. The

topography is generally hilly with elevations ranging from a low of 555 feet at the spillway of Acme Pond Dam to a high of 812 feet at the southeastern corner of the watershed. Basin slopes are moderate with grades ranging generally from 5% to 15%.

The dam at Acme Pond impounds water from a system of reservoirs originating approximately 2 miles north and east of the dam. Furthest upstream are the Eddy Pray Reservoir to the north and Killingly Pond to the east. Both of these reservoirs drain into Middle Reservoir. Alvia Chase Reservoir at the southeast portion of the watershed also discharges into Middle Reservoir. Middle Reservoir in turn drains into Bog Meadow Reservoir and then into Acme Pond. Because of the other reservoirs in the system, there is considerable storage available in the watershed. A schematic flow chart is shown in the Appendix. These storage areas will dampen and delay the peak of the surface runoff.

b. Discharge at Dam Site: No records of spillway or outlet works discharges are available. Listed below are calculated discharge data for the spillway and the 16" outlet pipe.

1. Outlet works:

Size:	16 inch diameter pipe
Invert Elev.	545.0 feet
Discharge capacity:	26 cfs (at normal pool level)

2. Maximum known flood at dam site: Discharge unknown.

3. Ungated spillway capacity at top of dam: 250 cfs at Elev. 558.2

4. Ungated spillway capacity at test flood elevation: 400 cfs at Elev. 559.1

5. Gated outlet works capacity at normal pool elevation: 26 cfs at Elev. 555.0

6. Gated outlet works capacity at test flood elevation: 36 cfs at Elev. 559.1

7. Total discharge capacity at test flood elevation: 440 cfs at Elev. 559.1

8. Total project discharge at top of dam: 280 cfs at Elev.558.2

9. Total project discharge at test flood elevation: 1,600 cfs at Elev.559.1

c. Elevation (Feet above National Geodetic Vertical Datum):

1. Streambed at toe of dam: 539.5
2. Bottom of cutoff: Unknown
3. Maximum tail water: Unknown
4. Normal pool: 555.0
5. Full flood control pool: N/A
6. Spillway crest: 555.0
7. Design surcharge (original design): Unknown
8. Top of dam: 558.2
9. Test flood surcharge: 559.1

d. Reservoir (Length in feet):

1. Normal pool: 600
2. Flood control pool: N/A
3. Spillway crest pool: 600
4. Top of dam: 600
5. Test flood pool: 600

e. Storage (acre-feet):

1. Normal pool: 16
2. Flood control pool: N/A
3. Spillway crest pool: 16
4. Top of dam: 29
5. Test flood pool: 34

f. Reservoir Surface (acres):

1. Normal pool: 3
2. Flood control pool: N/A
3. Spillway crest: 3
4. Test flood pool: 6
5. Top of dam: 5

g. Dam:

1. Type: Earth embankment  
vertical downstream  
masonry walls
2. Length: 570 feet
3. Height: 10 feet
4. Top width: 12 feet
5. Side slopes: 1.5H:1V upstream  
vertical and  
1.5H:1V downstream
6. Zoning: Unknown
7. Impervious core: Unknown
8. Cutoff: Unknown
9. Grout curtain: Unknown

h. Diversion and Regulating Tunnel: N/A

i. Spillway:

1. Type: Stone masonry  
broad crest weir
2. Length of weir: 16 feet
3. Crest elevation  
(without flashboards): 555.0 feet
4. Gates: None
5. U/S channel: Natural bed
6. D/S channel: Natural bed

j. Regulating Outlets:

1. Invert: 545.0 feet
2. Size: 16 inch diameter
3. Description: Cast iron pipe
4. Control mechanism: Manually operated gate valve beneath mill building.
5. Other The gate valve is approachable only through a manhole in the basement floor of the building.

## SECTION 2

### ENGINEERING DATA

2.1 Design: There is very little known about the design of the dam. It was constructed for power generation purposes probably during 1846. Plans for the original construction were not available. Mechanical power was generated in the adjacent building which is presently occupied by the Acme Cotton Company. Power generation was discontinued in 1945 and at that time an elevated water storage tank was erected for fire protection purposes. Water from the reservoir is pumped into this storage tank for fire prevention.

2.2 Construction: Nothing is known about the construction of the dam. Indications are that it was constructed during 1846, but there is no information available. Judging from the bedrock outcroppings and from the pitch of the bedrock, indications are that the dam was constructed on bedrock.

2.3 Operation: The dam was originally constructed for mechanical power generation. As indicated above, water is presently used for fire protection purposes only. The Acme Company, which owns the property, maintains the facilities, but keeps no formal records of operation. There are no records available indicating that the dam was ever overtopped.

2.4 Evaluation:

- a. Availability: The facilities were made available for visual inspection. All accessible operating parts of the facility were inspected. No plans or other design information were found to be available.
- b. Adequacy: The limited amount of data available was inadequate to perform an in-depth assessment of the dam and appurtenant facilities. Therefore, the final assessment of this dam must be based primarily on visual inspection, performance history, and hydraulic and hydrologic computations of spillway and outlet capacity.
- c. Validity: Due to the lack of available data, the conclusions and recommendations found in this report are based on the visual inspection and hydraulic/hydrologic computations.

SECTION 3  
VISUAL INSPECTION

**3.1 Findings:**

a. General: An inspection of Acme Pond Dam was performed on November 13, 1980 by Lenard & Dilaj Engineering, Inc. with the assistance of Geotechnical Engineers, Inc. The weather was cloudy and the temperature was about 30°F. At the time of inspection the water level in the pond was about 2 inches higher than the spillway crest elevation.

As a result of the visual inspection, the dam at Acme Pond and its appurtenances are judged to be in fair condition. Saplings up to 3 inches in diameter and bushes are growing on the earth embankments. Riprap is sparse along the upstream slope and portions of a masonry wall on the upstream side have also collapsed. Various portions of the downstream stone masonry wall are bulging and out of alignment.

b. Dam: The dam is an earth embankment dam with a downstream stone masonry wall. No construction drawings are available, nor are the details of design known. Indications are that the dam was built during 1846 at the time the original factory was erected.

1. Crest: The crest of the dam is covered with grass and it has a footpath along the center. Fifty feet from the left abutment there is a low area, approximately 20 feet long, in the crest of the dam, probably a result of past erosion or settlement (See Site Plan). There are a number of saplings growing on the crest, particularly near the spillway. Some of the saplings are 3 inches in diameter.
2. Upstream slope: The upstream slope of the dam is irregular with an inclination of about 1.5H:1.0V. Partial riprap protection is provided. The riprap consists of large 1 to 2 foot diameter stones (Photo 1). At the left abutment there is a short section of a dry masonry stone wall which changes into riprap protection (Photo 2). Between the intake structure and the spillway structure, the upstream stone wall has collapsed (Photo 9). There is also a heavy growth of bushes and saplings in this area of the upstream slope (Photo 9). There

are the remnants of a concrete wall on the upstream slope between the intake structure and spillway, but its purpose could not be ascertained. At the spillway, the joints of the upstream training walls have been cemented (Photos 7 and 8).

3. Downstream slope: The downstream stone masonry wall is the full height of the dam in the vicinity of the spillway and outlet structure and is about 7 feet lower than the dam elsewhere (Photos 3 and 4). The downstream stone wall has tilted in several areas, particularly near the right abutment (Photos 5 and 6). Because of the excessive tilting, the joints opened up as shown in Photo 6. It should be noted that the bulging of the downstream walls was first observed some time ago, as noted in the inspection report of William W. Pike in 1954. Apparently because of this report, a section of the downstream wall was repaired with a concrete wall left of the spillway (Photo 3). The concrete wall has no drainage holes. The remaining downstream slope above the wall is irregular and its inclination ranges from 1.5H:1.0V to 2.0H:1.0V. The slope has some growth of bushes and saplings. No seepage was observed on the downstream slope nor at the toe. A masonry stairway is built into the stone wall just south of the intake structure (See Site Plan and Photo 10). Immediately south of the stairway, the stone wall bulges as shown in Photo 10. Towards the left abutment several bedrock outcroppings were observed at the toe of the stone masonry wall. Indications are that this section of the dam is resting on bedrock. No seepage was noted on the left side of the dam.

c. Appurtenant Structures: The appurtenant structures for this dam are the spillway, the intake structure for a pipeline, and a gate structure at the left training wall of the spillway.

1. Spillway: The spillway is located near the right abutment and is constructed of cut stone masonry, with an approximately vertical downstream wall. Training walls are also constructed of stone masonry. On top of the left training wall there is an old inoperable gate structure (Photo 8), whose construction and dimensions could not be ascertained. It appears to have discharged through an opening visible just downstream of the spillway in the

vertical masonry wall. The training walls are in fair condition with some indication of longitudinal distortion (Photo 7). There are signs, however, that soil may be washing into the culvert, as shown by the cavities between stones of the training walls. The spillway flow passes beneath Bailey Hill Road and the mill building through a rectangular stone culvert with an arch at the entrance (Photo 3). There is a depression at the ground surface near the edge of the road at the upstream end of the culvert. The cause and extent of this depression could not be ascertained, but its implications should be studied along with the stability analysis. The culvert extends through the basement of the mill building and exits about 150 feet downstream of the dam. The spillway is in generally fair condition. Clear seepage exiting out of the downstream face of the spillway could be observed at the left end (Photo 11 and closeup, Photo 12). The quantity of seepage here and elsewhere on the downstream face could not be ascertained because of water flowing over the spillway. The spillway is a broad-crested weir and is 16 feet long at an elevation of 555 feet. The training walls extend 3 feet above the spillway crest on both sides. The approach channel was clear of obstructions, but showed signs of minor siltation.

2. Outlet works: The outlet works include a concrete intake structure which is in good condition (Photo 9) and two upstream stone wingwalls which could be observed under water. There is a 16 inch pipe which passes beneath the road, installed inside an existing 4 foot diameter steel plate pipe which shows signs of corrosion and whose condition should be assessed along with a stability analysis. A brick arch could be observed over the downstream end of this pipe where it entered the basement of the mill building. The outlet continues through the building as a culvert. The bottom of the culvert was cut into bedrock with masonry of different types above. The outlet joins the spillway culvert immediately upstream of the point where the flow exits out of the building into an open channel (See Site Plan).

There is another outlet, as shown on Photo 8, with a wooden sluice gate on the left training wall. This outlet discharges immediately downstream of the spillway, but is not presently operable. The intake end of this outlet could not be observed because it was under water.

- d. Reservoir area: The reservoir edge slopes gently in the vicinity of the dam. Near the left abutment of the dam and on the south shore of the reservoir, bedrock is exposed. Indications are that bedrock is sloping from the south shore towards the mill building.
- e. Downstream channel: The channel downstream of the mill building carries the spillway and outlet flow. It is an open channel, with stone walls adjacent to the mill building, and irregularly sloped banks downstream. The channel does not contain any significant obstructions to the flow.

3.2 Evaluation: On the basis of the visual inspection, the dam is judged to be in fair condition. The integrity of the dam could be affected in the future by the continued tilting of the downstream wall at several locations along the dam, by the corrosion of the 4 foot diameter pipe beneath the dam and road, and by the distortion of the spillway training walls. There are also indications of soil washing into the stone culvert below the spillway, as shown by the cavities between stones of the training walls. If the culvert were to deteriorate and eventually collapse, the water would flow along the road and cause flooding of the mill structure.

There is depression on the dam crest near the left abutment. The partial collapse and irregularity of riprap on the upstream slope may further erode if not repaired and could cause deterioration of the dam. There is extensive growth of saplings and small bushes, in particular, near the spillway. This growth should be checked and regularly cleared.

Although some discharge capacity is available through the 16 inch outlet pipe, the valve is opened only on an intermittent basis and because of its location beneath the building, it may not be accessible in an emergency situation. Because the old outlet works near the spillway is inoperable, it is possible that there may not be any functioning outlet during an emergency.

## SECTION 4

### OPERATIONAL AND MAINTENANCE PROCEDURES

#### 4.1 Operational Procedures:

- a. General: The Acme Cotton Company operates the dam and appurtenant facilities. The operation of this facility is for fire protection purposes only. Pumping equipment installed in the basement of the factory draws on the 16 inch discharge pipe and delivers water into the elevated storage tank. There are no operational procedures at the dam. Water level is at spillway elevation, and according to reports, the dam has never been overtopped.
- b. Description of any Warning System in Effect: Emergency action and/or warning is coordinated through the operations department of the Acme Company. No formal emergency or contingency plan is in effect.

#### 4.2 Maintenance Procedures:

- a. General: Maintenance is carried out as the need arises; no set procedure is in effect. Trees and other material have been removed from the dam and it is maintained in fair condition.
- b. Operating Facilities: The outlet gate is in disrepair and not operational. The fire protection equipment utilizing discharge from the pond is maintained within the mill building. The valve controlling the 16 inch discharge pipe is opened only on an intermittent basis to check its operation.

#### 4.3 Evaluation: Maintenance of the dam and appurtenant facilities is inadequate. A formal program of operational maintenance procedures should be implemented including documentation to provide complete records for future reference. Also, a downstream warning system should be developed and implemented.

## SECTION 5

### EVALUATION OF HYDRAULIC/HYDROLOGIC FEATURES

5.1 General: Acme Pond Dam is an earth embankment dam with a vertical stone masonry face along part of the downstream side. The dam is approximately 570 feet long and 10 feet high. Its spillway has a length of 16 feet and the crest is 3.2 feet below the top of the dam. For purposes of hydraulic calculations the spillway weir was considered to be broad crested. A 16-inch discharge pipe passes through the dam and is controlled by a gate valve which is operated on an intermittent basis.

The downstream channel passes beneath the road and mill building and is restricted at its narrowest point to an opening of 3 feet by 4 feet. Once it exits from the building, the flow passes through another pond and dam and then into a steep wooded channel.

The watershed encompasses an area of 5.16 square miles. Its upper reaches are basically undeveloped while the lower portion has some residential areas.

At spillway elevation, Acme Pond has a storage capacity of approximately 16 acre-feet; this increases to 29 acre-feet at the top of the dam.

5.2 Design Data: No design data was found to be available for this dam.

5.3 Experience Data: According to long-term personnel at the site, the dam has never been overtopped.

5.4 Test Flood Analysis: Based on the "Recommended Guidelines for Safety Inspection of Dams", the dam is classified as SMALL in size with a HIGH hazard potential. The test flood for these conditions ranges from half the Probable Maximum Flood to the Probable Maximum Flood ( $\frac{1}{2}$  PMF to PMF). Because of the size of the dam, the potential downstream damage, and the possible loss of life involved with failure, the  $\frac{1}{2}$  PMF was chosen as the test flood for this dam.

Using the HEC-1 Flood Hydrograph Computer program developed by the Army Corps of Engineers for dam safety investigations,

the inflow and outflow for the test flood were found to be 1,670 cfs and 1,660 cfs, respectively. As a basis of comparison, the PMF resulted in an inflow and outflow of 9,160 cfs. The spillway capacity of 250 cfs represents 15% of the test flood outflow. One foot of overtopping would be associated with this outflow.

In development of the inflow hydrograph to Acme Pond, several upstream reservoirs were considered in the calculations. Because of the storage available at these sites, the effect of the test flood is considerably damped.

5.5 Dam Failure Analysis: A dam failure analysis was performed using the "Rule of Thumb" method for estimating downstream dam failure hydrographs established by the Corps of Engineers. Failure was assumed to occur when the water level in the pond was at the level of the top of the dam.

The calculated dam failure discharge is 10,600 cfs and will produce a depth of flow of approximately 10 feet at the mill immediately downstream of the dam, where there was no flow prior to failure since the spillway discharge passes beneath the mill. The failure analysis covered a distance of approximately 1,400 feet downstream, as shown by the calculations in Appendix D. The depth of flow at that point was calculated to be approximately 2.6 feet for the dam failure, indicating an increase in depth of 2 feet over the pre-failure flow of 250 cfs from the spillway.

The dam breach would cause appreciable damage and the possible loss of more than a few lives at the mill downstream of the dam. As shown above, the level of the water at the mill in the event of a failure would be 10 feet, high enough to inundate the basement level and first two floors.

SECTION 6  
EVALUATION OF STRUCTURAL STABILITY

- 6.1 Visual Observations: The visual inspection showed evidence of instability in several areas of the dam. The downstream wall has tilted locally at several points, particularly near the right abutment. Stones dislodged from these tilted walls could lead to an unstable situation in this area of the dam. At the upstream end of the culvert passing the spillway discharge beneath the mill building, there is evidence of a depression. Because it could lead to a collapse and blockage of the discharge channel, the cause and extent of this depression should be further investigated. The 4 foot diameter steel plate pipe passing beneath the dam and road is corroded. Because it houses the only discharge pipe from the dam (the 16" diameter pipe), its condition should be further assessed and evaluated. Failure of this pipe casing would mean the loss of the only means of drawing down the water from the pond behind the dam, and it could also lead to a partial collapse of the dam over the section of pipe passing beneath it. The longitudinal distortion of the spillway walls could lead to the collapse of the spillway channel or a blockage of the opening. Along with the cavities between the stones of these walls, which may indicate a wash out of soil particles, this distortion should be assessed and repairs instituted. It is recommended that an in-depth stability analysis of the dam be conducted, particularly with respect to the above mentioned items of concern.
- 6.2 Design and Construction Data: There was no design and construction data available at the time of inspection.
- 6.3 Post-Construction Changes: There are no known structural post-construction changes except for the construction of a downstream concrete wall left of the spillway and the installation of the 16-inch pipe into the 4 foot diameter penstock.
- 6.4 Seismic Stability: The dam is located near the boundary between seismic zones 1 and 2 and in accordance with the Phase I inspection guidelines does not warrant seismic stability analysis.

## SECTION 7

### ASSESSMENT, RECOMMENDATIONS, AND REMEDIAL MEASURES

#### 7.1 Dam Assessment:

- a. Condition: The visual inspection indicates that Acme Pond Dam is in FAIR condition. The major concerns regarding the long term performance of this dam include:
  1. Continued tilting and bulging of the downstream stone masonry wall at several locations along the dam.
  2. Overtopping of the dam by test flood flows as well as storms of lesser magnitude.
  3. Lack of complete riprap coverage on the upstream slope.
  4. Vegetation and sapling growth on the upstream and downstream slope of the embankment.
  5. A depression on the crest of the dam near the left abutment and a depression at the upstream end of the culvert at the spillway.
  6. The corrosion of the 4 foot diameter steel plate pipe passing beneath the dam and the road.
- b. Adequacy of Information: The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on the visual inspection, past performance history, and sound engineering judgment.
- c. Urgency: The recommendations and remedial measures described below should be implemented by the Owner within one year of the receipt of this Phase I Inspection Report.

#### 7.2 Recommendations: The Owner should engage the services of a qualified registered engineer to accomplish the following:

- a. Conduct an in-depth hydraulic and hydrologic study to determine what alternative measures are necessary to significantly improve discharge capabilities of the dam, spillway and discharge channel, to reduce the overtopping potential, and to provide adequate freeboard allowances. Alternatives may include an emergency spillway, independent of the existing appurtenances.
- b. Restore riprap protection on the upstream slope in unprotected areas.
- c. Analyze the stability of the dam and the downstream stone wall in particular. Stabilization measures should include appropriate drainage features. Also, analyze and assess the depression at the culvert spillway and the condition of the 4' diameter outlet pipe casing.
- d. Restore the crest elevation of the dam to a uniform height.
- e. Investigate the condition of the right spillway wall, which shows signs of longitudinal distortion.

### 7.3 Remedial Measures:

#### a. Operating and Maintenance Procedures:

1. Saplings and brush on the dam should be removed and any excavations resulting therefrom should be backfilled with suitable material. Grass should be planted in these disturbed areas to protect the embankment from erosion.
2. Emergency procedures, consisting of an operations and warning system for downstream residents and downstream manufacturing, should be developed and implemented.
3. Technical inspections of this facility should be continued on an annual basis. A system should be developed for the recording of data with regard to items such as: water levels, discharges, time and drawdown to assist those responsible for the monitoring and operation of the structure. The dam should be monitored particularly during and after periods of intense rainfall.

4. Implement and intensify a program of diligent and periodic maintenance including, but not limited to: mowing brush on slopes; backfilling animal burrows or tire ruts with suitable well tamped material; cleaning debris from spillways and slopes.

7.4 Alternatives: There are no practical alternatives to the recommendations of Sections 7.2 and 7.3.

**APPENDIX A**  
**INSPECTION CHECKLIST**

VISUAL INSPECTION CHECKLIST  
PARTY ORGANIZATION

PROJECT ACME POND DAM

DATE NOVEMBER 13, 1980

TIME 9 am

WEATHER Cloudy

W.S. ELEV. 2" > spillway U.S. DN.S.

PARTY:

1. John Lenard, L.D.E.I. 6. \_\_\_\_\_
2. Michael Dilaj, L.D.E.I. 7. \_\_\_\_\_
3. Karl Acimovic, L.D.E.I. 8. \_\_\_\_\_
4. Kent Healy, L.D.E.I. 9. \_\_\_\_\_
5. Gonzalo Castro, GEI 10. \_\_\_\_\_

PROJECT FEATURE	INSPECTED BY	REMARKS
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1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_
10. \_\_\_\_\_

## PERIODIC INSPECTION CHECKLIST

PROJECT ACME POND DAM DATE NOVEMBER 13, 1980

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>DAM EMBANKMENT</u>	
Crest Elevation	
Current Pool Elevation	
Maximum Impoundment to Date	<i>Reportedly never overtopped.</i>
Surface Cracks	<i>None observed.</i>
Pavement Condition	<i>Not applicable.</i>
Movement or Settlement of Crest	<i>None observed.</i>
Lateral Movement	<i>Downstream wall tilted along most of length.</i>
Vertical Alignment	<i>Too irregular to judge.</i>
Horizontal Alignment	<i>Downstream wall bulged at several locations.</i>
Condition at Abutment and at Concrete Structures	<i>Good.</i>
Indications of Movement of Structural Items on Slopes	<i>Not applicable.</i>
Trespassing on Slopes	<i>Footpath on downstream slope and along crest.</i>
Sloughing or Erosion of Slopes or Abutments	<i>None observed.</i>
Rock Slope Protection - Riprap Failures	<i>Randomly distributed.</i>
Unusual Movement or Cracking at or Near Toe	<i>None, except for wall movement.</i>
Unusual Embankment or Downstream Seepage	<i>None observed.</i>
Piping or Boils	<i>None observed.</i>
Foundation Drainage Features	<i>None known.</i>
Toe Drains	<i>None known.</i>
Instrumentation System	<i>None known.</i>
Vegetation	<i>Grass, bushes, saplings.</i>

## PERIODIC INSPECTION CHECKLIST

PROJECT ACME POND DAM DATE NOVEMBER 13, 1980

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>DIKE EMBANKMENT</u> Crest Elevation Current Pool Elevation Maximum Impoundment to Date Surface Cracks Pavement Condition Movement or Settlement of Crest Lateral Movement Vertical Alignment Horizontal Alignment Condition at Abutment and at Concrete Structures Indications of Movement of Structural Items on Slopes Trespassing on Slopes Sloughing or Erosion of Slopes or Abutments Rock Slope Protection - Riprap Failures Unusual Movement or Cracking at or Near Toes Unusual Embankment or Downstream Seepage Piping or Boils Foundation Drainage Features Toe Drains Instrumentation System Vegetation	<i>There is no dike at this location.</i>

**PERIODIC INSPECTION CHECKLIST**

PROJECT ACME POND DAM DATE NOVEMBER 13, 1980

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - INTAKE CHANNEL AND INTAKE STRUCTURE</u>	
a. Approach Channel	<i>Not observable, under water.</i>
Slope Conditions	
Bottom Conditions	
Rock Slides or Falls	
Log Boom	
Debris	
Condition of Concrete Lining	
Drains or Weep Holes	
b. Intake Structure	
Condition of Concrete	<i>Good, some spalling at water level.</i>
Stop Logs and Slots	<i>None.</i>

## PERIODIC INSPECTION CHECKLIST

PROJECT ACME POND DAM DATE NOVEMBER 13, 1980

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - CONTROL TOWER</u>  a. Concrete and Structural General Condition Condition of Joints Spalling Visible Reinforcing Rusting or Staining of Concrete Any Seepage or Efflorescence Joint Alignment Unusual Seepage or Leaks in Gate Chamber Cracks Rusting or Corrosion of Steel  b. Mechanical and Electrical Air Vents Float Wells Crane Hoist Elevator Hydraulic System Service Gates Emergency Gates Lightning Protection System Emergency Power System Wiring and Lighting System	<i>There is no control tower at this location.</i>

## PERIODIC INSPECTION CHECKLIST

PROJECT ACME POND DAM DATE NOVEMBER 13, 1980

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - TRANSITION AND CONDUIT</u>  General Condition of Concrete Rust or Staining on Concrete Spalling Erosion or Cavitation Cracking Alignment of Monoliths Alignment of Joints Numbering of Monoliths	

## PERIODIC INSPECTION CHECKLIST

PROJECT ACME POND DAM DATE NOVEMBER 13, 1980

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL</u>	<i>Outlet channel is a 4-ft. pipe with an inside 16-in. pipe and a brick arch culvert under building. Both culvert inverters are in bedrock.</i>
General Condition of Concrete	<i>Brick arch culvert in good condition.</i>
Rust or Staining	<i>4-ft. pipe in fair condition, but inside 16-in. pipe in good condition. Upstream end of stone culvert in good condition.</i>
Spalling	<i>Not applicable.</i>
Erosion or Cavitation	<i>Not applicable.</i>
Visible Reinforcing	<i>Not applicable.</i>
Any Seepage or Efflorescence	<i>Not applicable.</i>
Condition at Joints	<i>Not applicable.</i>
Drain holes	<i>Not applicable.</i>
Channel	<i>Natural stream channel.</i>
Loose Rock or Trees Overhanging Channel	<i>Several trees overhanging channel.</i>
Condition of Discharge Channel	<i>Good.</i>

## PERIODIC INSPECTION CHECKLIST

PROJECT ACME POND DAM DATE NOVEMBER 13, 1980  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS</u>	
a. Approach Channel	<i>Reservoir.</i>
General Condition	
Loose Rock Overhanging Channel	
Trees Overhanging Channel	
Floor of Approach Channel	
b. Weir and Training Walls	<i>Cut stone dry masonry.</i>
General Condition	<i>Good, some settling or lost stones in right wall.</i>
Rust or Staining	<i>Not applicable.</i>
Spalling	<i>Not applicable.</i>
Any Visible Reinforcing	<i>Not applicable.</i>
Any Seepage or Efflorescence	<i>Leakage out of left side of downstream face of spillway.</i>
Drain Holes	<i>Not applicable.</i>
c. Discharge Channel	<i>Square stone culvert, arches at transitions.</i>
General Condition	<i>Good.</i>
Loose Rock Overhanging Channel	<i>Not applicable.</i>
Trees Overhanging Channel	<i>Not applicable.</i>
Floor of Channel	<i>Bedrock.</i>
Other Obstructions	<i>Columns towards downstream end of culvert.</i>
Other Comments	

## PERIODIC INSPECTION CHECKLIST

PROJECT ACME POND DAM DATE NOVEMBER 13, 1980

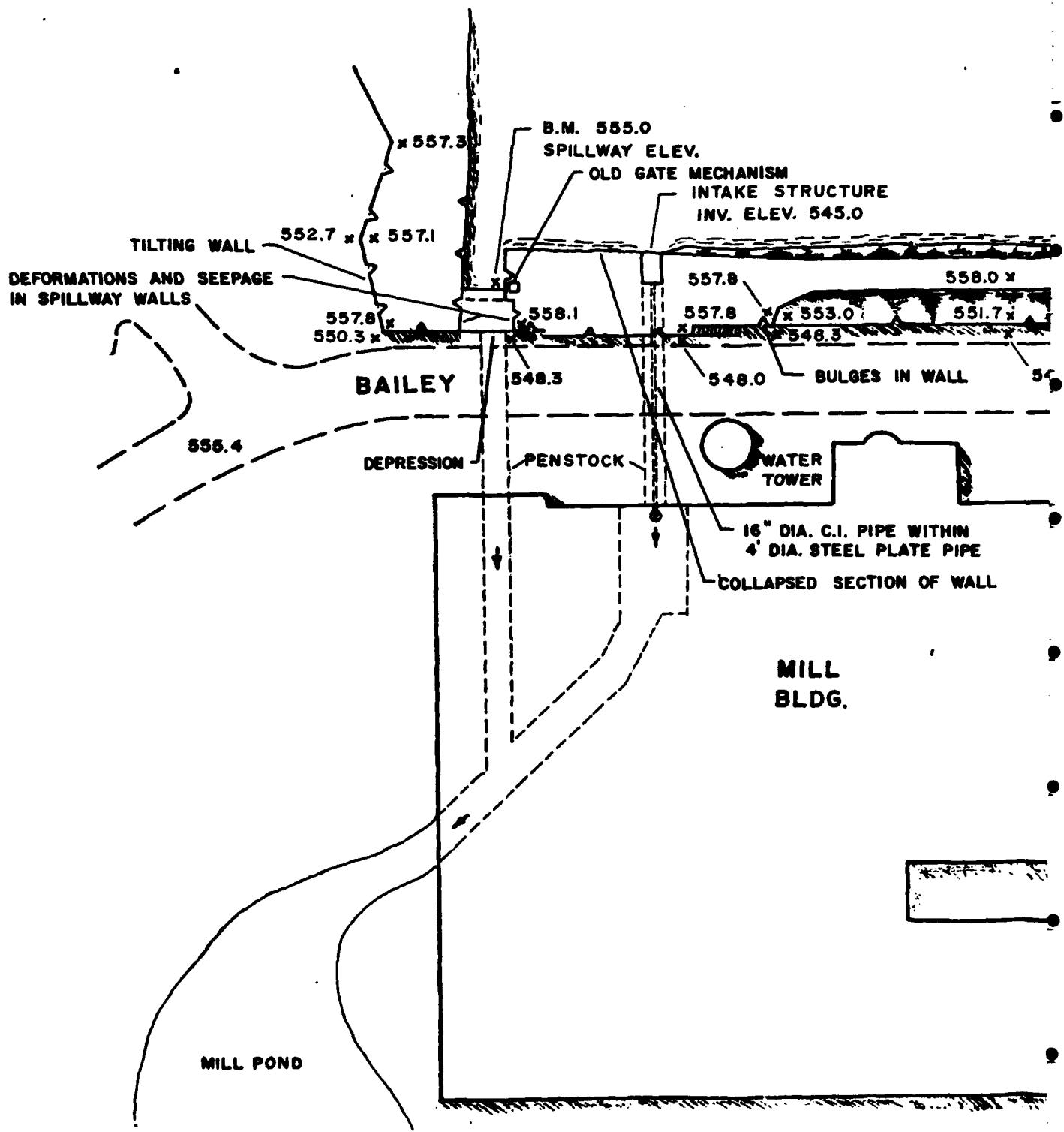
PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

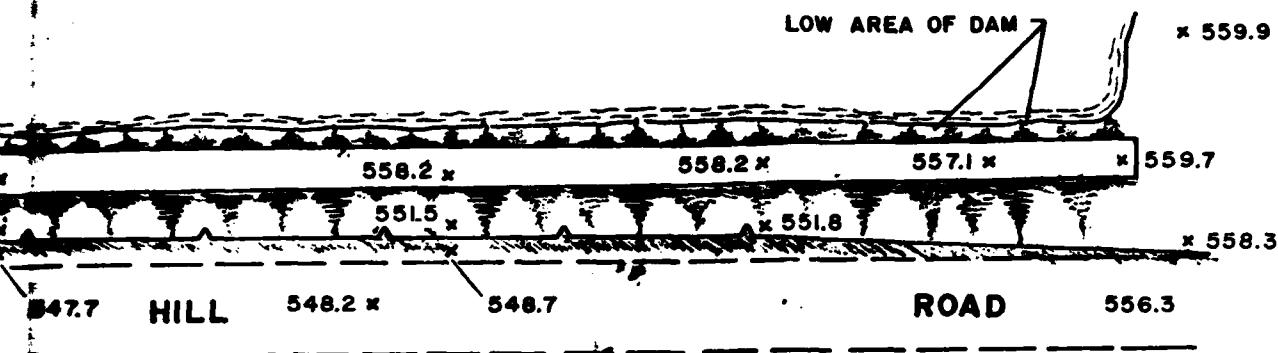
AREA EVALUATED	CONDITION
<u>OUTLET WORKS - SERVICE BRIDGE</u> a. Super Structure Bearings Anchor Bolts Bridge Seat Longitudinal Members Underside of Deck Secondary Bracing Deck Drainage System Railings Expansion Joints Paint b. Abutment & Piers General Condition of Concrete Alignment of Abutment Approach to Bridge Condition of Seat & Backwall	<i>There is no service bridge at this location.</i>

**APPENDIX B**

**ENGINEERING DATA**



ACME POND



50 0 50 100  
scale feet

LEONARD DILAS ENGINEERING, INC. US ARMY ENGINEER DIV. NEW ENGLAND  
STAMFORD, CONNECTICUT CORPS OF ENGINEERS  
BOSTON, MASSACHUSETTS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

**SITE PLAN**  
**ACME POND DAM**  
**KILLINGLY, CONN**

DRAWN BY: C. J. O. CHECKED BY: R. A. APPROVED BY: J. J. SCALE: 1" = 50'  
DATE: DEC 60 SHEET B-1

### HISTORY OF ACME POND DAM

The Acme Pond Dam is located across the street from the Acme-Chasten Warehouse. This warehouse is a conglomerate of much older buildings. The oldest portion of the warehouse dates back to 1846. This section measures 36'x 100' and is 4 stories high. It was built by Westcott and Pray, probably as a cotton cloth mill.

The major source of water for the mill was supplied by the Middle and Bog Meadow Reservoirs. In 1832 Ebenezer Young built the dam at the Middle Reservoir. The Bog Meadow Reservoir was raised 2 feet in 1849 by Westcott and Pray to increase storage to operate their mill. Five years later Eddy Pray Reservoir Dam was constructed by the Chestnut Hill Reservoir Company. This dam failed in May 1865, but it was promptly rebuilt and has stood since that time.

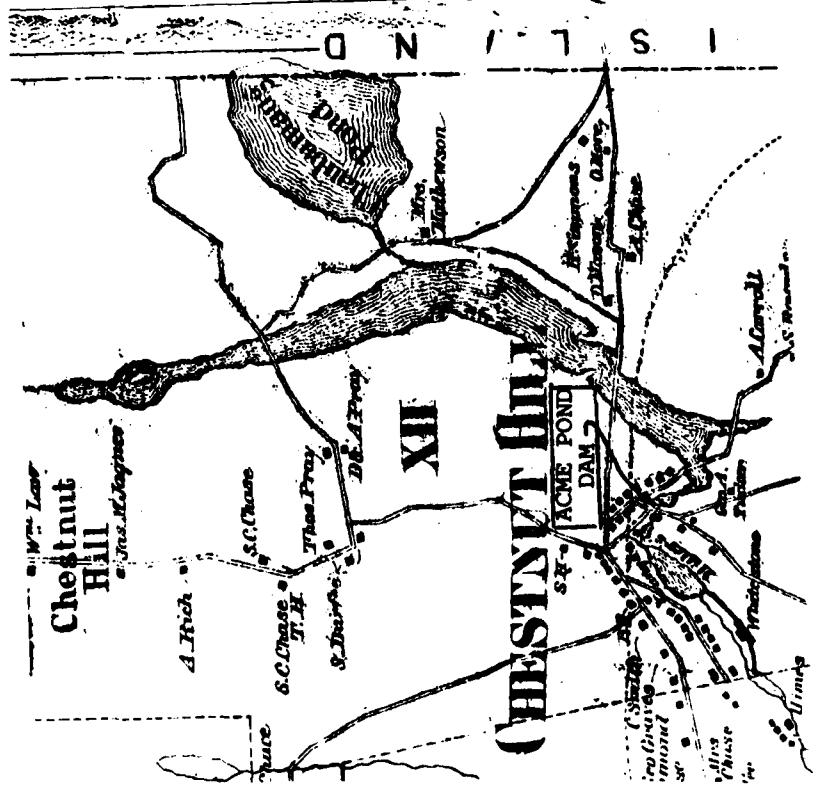
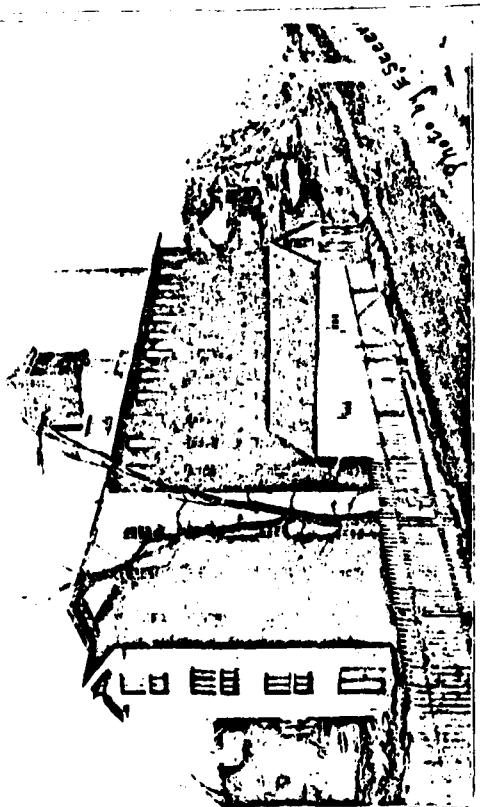
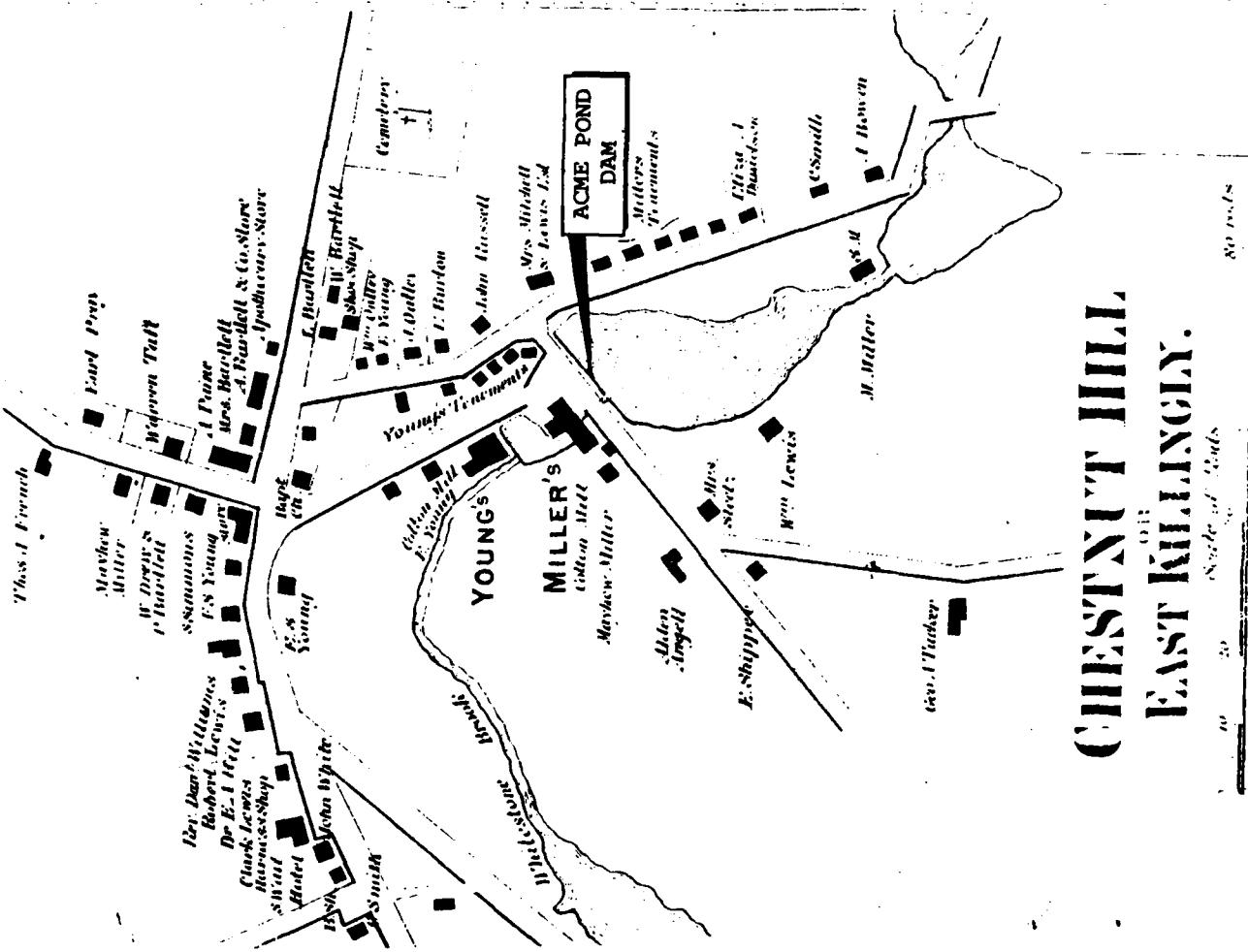
After the mill was built in 1846, it changed hands at least seven times until 1981, when Acme purchased the property. The chronological order of owners includes:

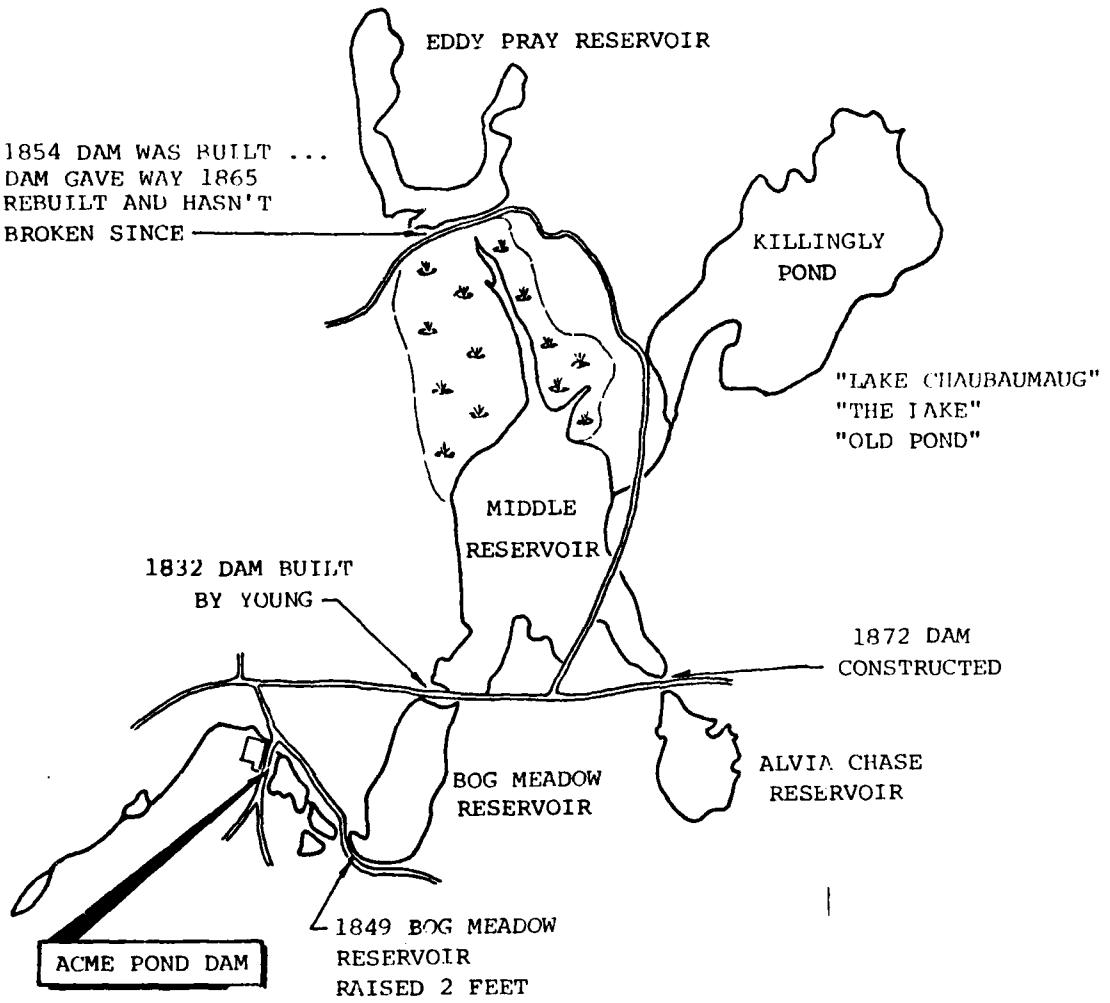
John D. Burgess	1849-1856
Mayhew Miller	1856-1869
Thomas Pray	1869-1874
John L. Ross	1874-1899
A.G. Bishop	1899- ?
United Tool Co.	1907-1910
Walter Guile	1910-1918

In 1872 the "old fashioned wooden breast wheels" were replaced by the "modern" turbines in the mill. At this time steam furnaces were installed to complement the available waterpower. According to James Minges and Associates of Farmington, "Up until the 1920's the plant used water as a source of power which created the need for the storage of water ...". In 1945, a 16" cast iron pipe equipped with gate valves was slid into the much older 4' diameter steel pipe for use as an intake pipe. Water was only used for bleaching operations, so the 4' diameter pipe was too large. The condition of the 4' pipe is not known.

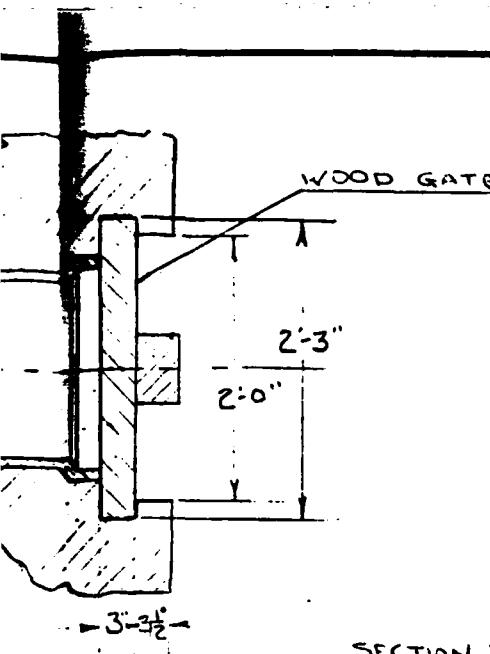
William W. Pike inspected all of the Chestnut Hill Reservoir dams in 1946, 1949 and again in 1954. The Acme Pond Dam was only mentioned in the 1954 inspection, when he recommended retaining wall improvements on the Acme Pond Dam's south side. (See Photo

In January 1954 C.H. Knox recommended seasonal adjustments for the system of dams to adjust the reservoir levels. However, the Minges report notes that in 1972, "the dams are presently kept at fixed high water levels and the gates are only opened for inspection or for gate maintenance."





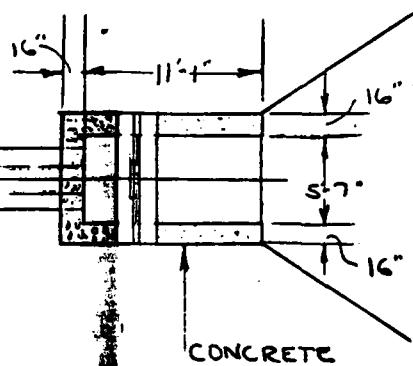
Layout of  
ACME POND RESERVOIR SYSTEM  
For Historical References  
Not To Scale



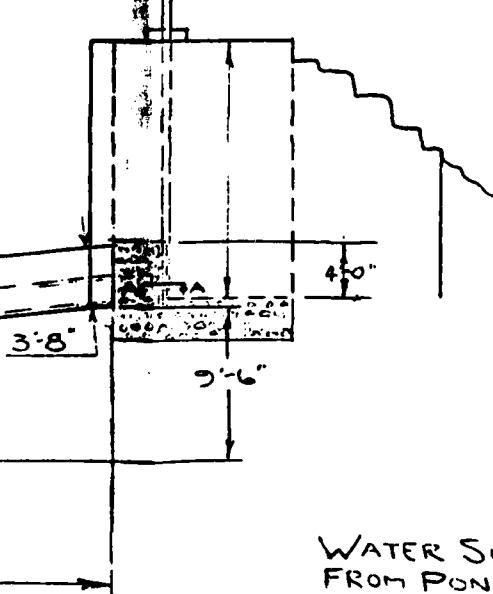
SECTION "A:A"

SCALE = 1" = 1'-0"

ST IRON PIPE, CLASS "C"  
PRESSURE - AVERAGE WEIGHT  
PER FOOT IN 16' LENGTHS  
PIGOT JOINTS, CAULKED WITH  
BY THE CRYSTAL WATER CO.



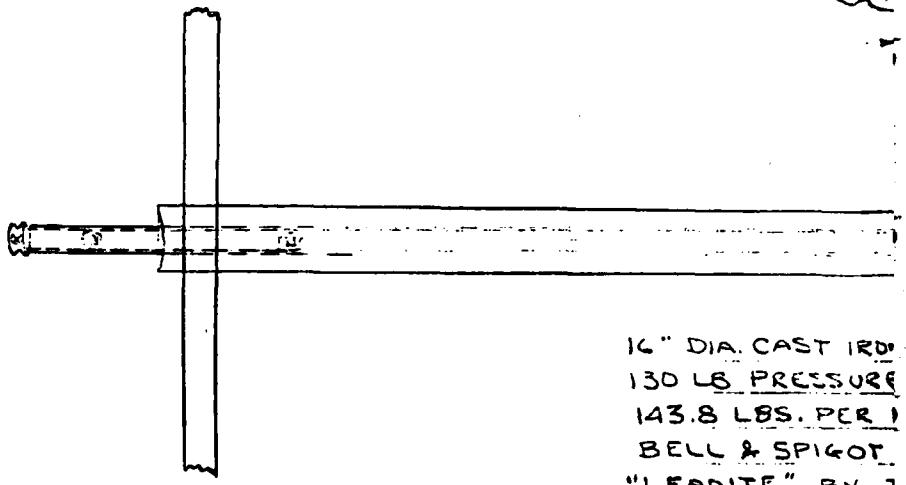
STEEL PIPE



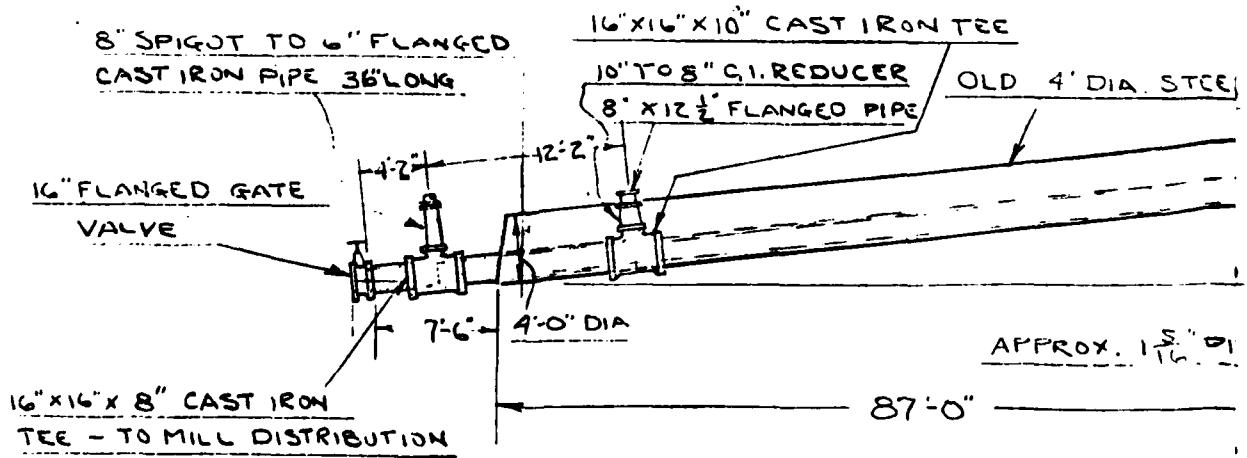
5/16" PITCH PER FOOT OR 6 1/2°

WATER SUPPLY PIPE LINE  
FROM POND INTO MILL  
11-19-45 CHK

1" = 1'-0"



143.8 LBS. PER FT  
BELL & SPIGOT  
"LEADITE" BY



CHESTNUT HILL RESERVOIR CO.

EAST KILLINGLY, CONN.

DANIELSON 4-5541

May 3rd, 1954

Mr. William W. Pike  
22 Hutchins Street  
Danielson, Connecticut

Dear Mr. Pike:

Mr. Buckman has asked me to request you to make an inspection of the dams and other properties of the Chestnut Hill Reservoir Company, as you have in years past.

Please send us a written report stating the condition in which you find the various dams, etc.

Thanking you we remain

Yours very truly

CHESTNUT HILL RESERVOIR CO.

*CHK*

C. H. Knox,

CHK/dw

September 4, 1954

WORK NEEDED TO BE DONE ON THE DAMS  
OF  
THE CHESTNUT HILL RESERVOIR CO.

There are three items of work that apply to all of the dams, namely:

1. Trees should be cut and the brush should be kept cut from all of the dams.
2. Leaks should be stopped, driving plank bracing where necessary.
3. Woodchuck holes should be stopped up.

The following conditions were found at the different dams and should be given attention:

HOME RESERVOIR

1. The stone wall on the lower side of the dam (South end) is being pushed out by the earth of the dam and this wall is leaning to the degree where it is no longer very stable.
2. The stone wall on the lower side of the dam at the transformer station is also leaning considerably.

BOG BAGED RESERVOIR

1. Vegetation is clogging the channel just above the gates. This vegetation appears not to be securely rooted and thus likely to move about and could foul the gates.

ALVIA CHASE RESERVOIR

1. Water is leaking through the stonework at the gates. There appears to be more water going through the stonework than is going through the gates. At the present time there is no indication of undermining, the undermining that was evident two years ago has been filled in and does not show. However, such a volume of water going through the stonework is very likely taking away some of the earth which backs up said stonework.

OLD KILLINGLY POND

1. Earth fill has been placed on the lower side of the dam at its westerly end and this has backed up the leaning wall and should prevent its falling. A section of the top of this leaning wall near the westerly end of the dam has to be torn down now. This earth backing should extend the entire length of the dam.

September 4, 1954

WORK NEEDED TO BE DONE ON THE DAMS  
OF  
THE CHESTNUT HILL RESERVOIR CO.  
(continued)

WHITE PINE RESERVOIR

1. This reservoir is not now in use. The leaks in said dam which have persisted for many years are still there even though the water is not high enough to run through said leaks.
2. The ditch at the foot of the dam should be cleaned out and opened up to let the water at the foot of the dam drain off so that the soil at the foot of the dam would not be so soft.

Respectfully submitted,  
September 4, 1954,

William W. Pike

4 June 1973

Acme Carton Products Company, Inc.  
147 South Franklin Avenue  
Valley Stream, New York

K-10

Re: Acme Pond  
Killingly, CT

Gentlemen:

Members of our staff recently inspected the above named dam on Whetstone Brook, which our records indicate belongs to you.

In general, the structure appears safe. I would, however, like to point out two areas of concern:

1. Determining and repairing the source of seepage in the south corner of the spillway would prevent further deterioration and possibly a much more expensive repair job in the future.
2. Brush which is growing on the upstream side of the dam should be removed.

Please consider the above as suggestions and not as a formal order by this department.

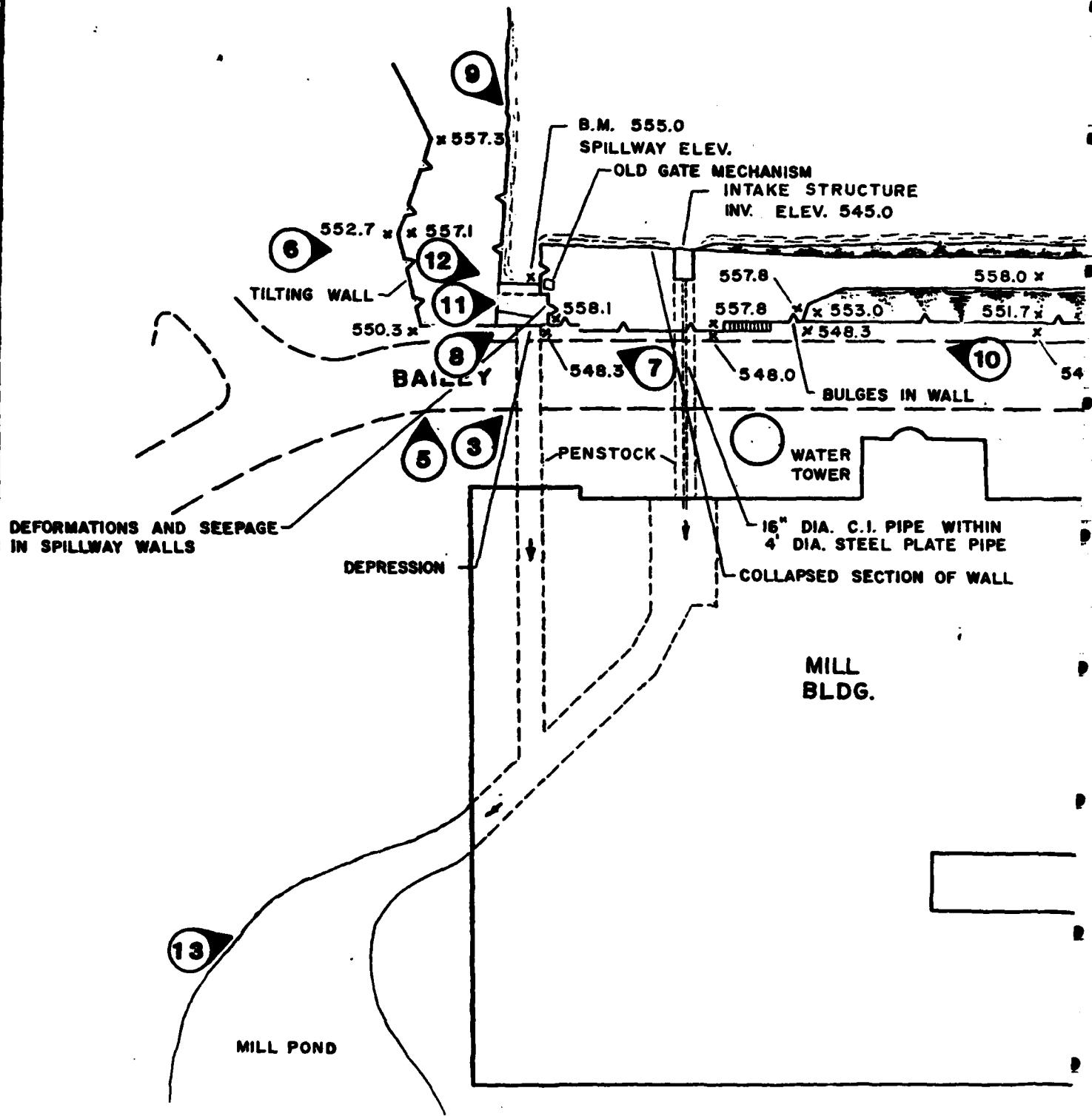
Very truly yours,

Victor F. Galgowski  
Supt. of Dam Maintenance  
Water & Related Resources

VFG:ljg

**APPENDIX C**

**PHOTOGRAPHS**



ACME POND



1

2

LOW AREA OF DAM x 559.9

558.2 x

558.2 x

557.1 x

x 559.7

551.5 x

x 551.8

x 558.3

547.7 HILL

548.2 x

548.7

ROAD

4

50 0 50 100  
scale feet

LEONARD DIAJ ENGINEERING, INC. US ARMY ENGINEER DIV. NEW ENGLAND  
STORRS, CONNECTICUT CORPS OF ENGINEERS  
ENGINEER WALTHAM, MASSACHUSETTS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

**PHOTO INDEX**  
**ACME POND DAM**  
**KILLINGLY, CONN**

DRAWN BY CHECKED BY APPROVED BY SCALE 1" = 50'  
4.0 R.A. J.L. DATE DEC 60 SHEET C-1

2



Photos 1 & 2. View of upstream side of dam as seen from left abutment. Note stone wall near left abutment and large riprap to the right of the dam. Spillway is at far right.

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ENGINEERS

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INSPECTION OF  
NON-FED. DAMS

ACME POND DAM  
KILLINGLY, CONNECTICUT

CT 00172

JAN. 1981

C-2



Photo 3. Downstream wall of dam and spillway. Note reinforced concrete wall installed to the left of the spillway.



Photo 4. Overall view of downstream wall and slope.

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INSPECTION OF  
NON-FED. DAMS

ACME POND DAM  
KILLINGLY, CONNECTICUT  
CT 00172  
JAN. 1981  
C-3



Photo 5. Tilted downstream wall near right abutment.

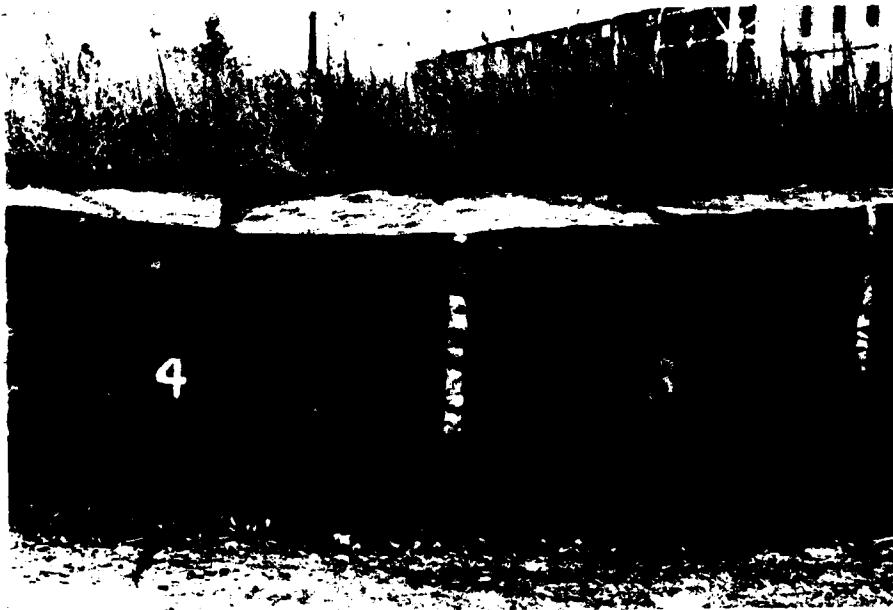


Photo 6. Closeup of tilted downstream wall at right abutment. Note voids between stones as a result of tilting of wall. Markings on wall are for parking purposes.

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---	---

NATIONAL PROGRAM OF  
INSPECTION OF  
NON-FED. DAMS

ACME POND DAM  
KILLINGLY, CONNECTICUT  
CT 00172  
JAN. 1981  
C- 4



Photo 7. Right wall of spillway. Note apparent deformation of wall.

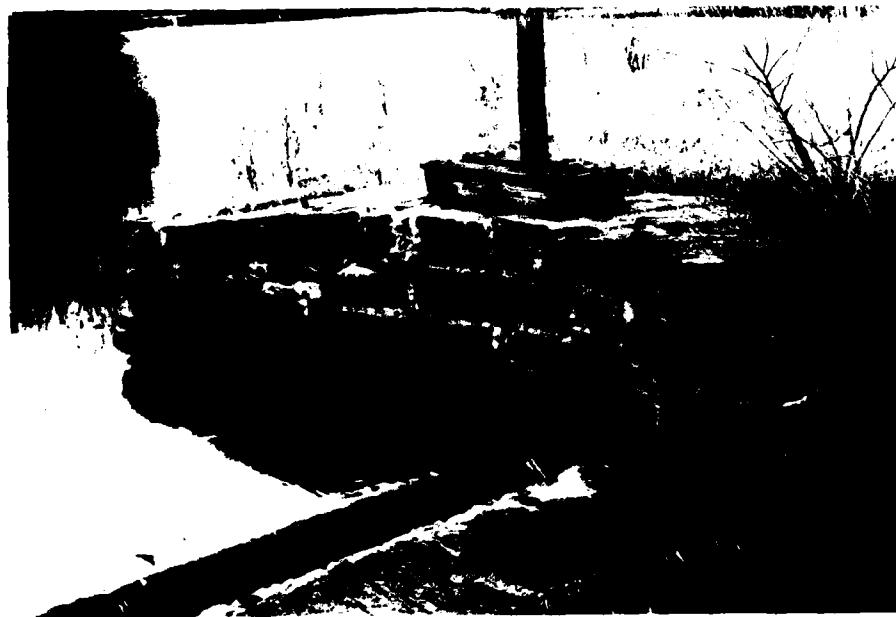


Photo 8. Left training wall of spillway. Note remains of gate mechanism. Discharge from gate mechanism is apparently downstream of spillway wall.

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NON-FED. DAMS

ACME POND DAM  
KILLINGLY, CONNECTICUT  
CT 00172  
JAN. 1981  
C- 5



Photo 9

Upstream wall between inlet structure and spillway.

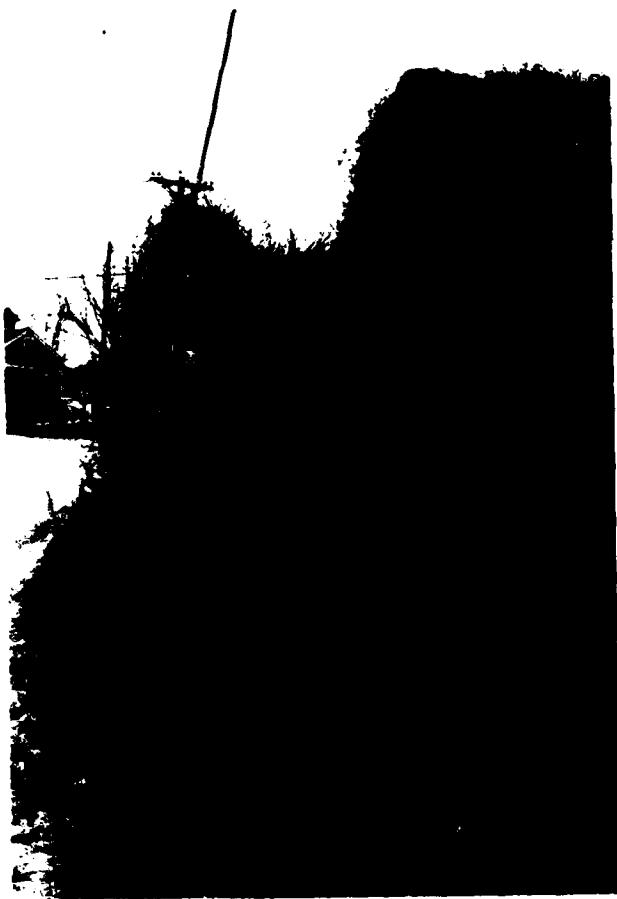


Photo 10

Downstream wall of dam at stairs left of spillway. Note bulging of wall at about third point from bottom.

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NON-FED. DAMS

ACME POND DAM  
KILLINGLY, CONNECTICUT  
CT 00172  
JAN. 1981  
C-6

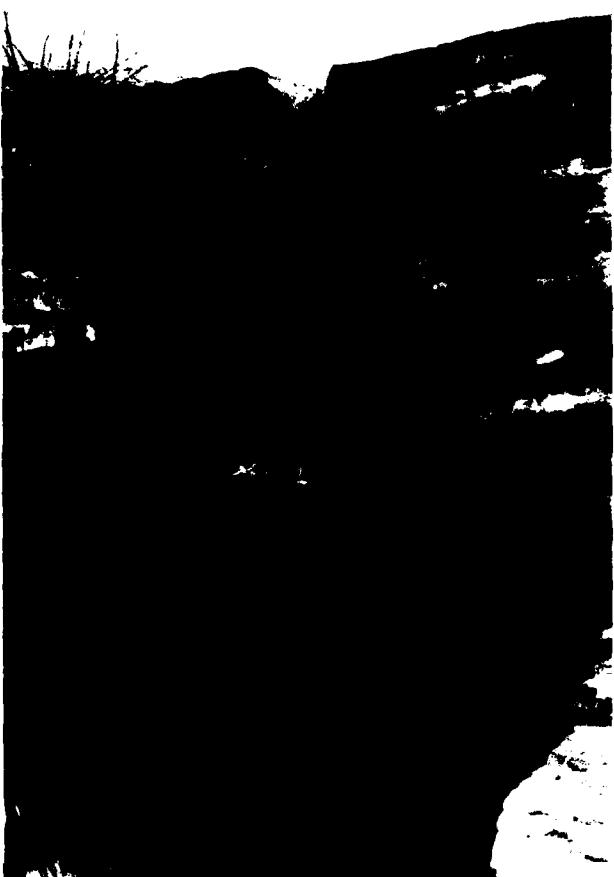


Photo 11

Left wall of spillway. Note leakage at corner of wall and downstream face of spillway.



Photo 12

Closeup of leakage of left wall.

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NATIONAL PROGRAM OF  
INSPECTION OF  
NON-FED. DAMS

ACME POND DAM  
KILLINGLY, CONNECTICUT  
CT 00172  
JAN. 1981  
C-7



Photo 13. Outlet side of spillway discharge channel below mill building.

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STORRS, CONNECTICUT  
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INSPECTION OF  
NON-FED. DAMS

ACME POND DAM  
KILLINGLY, CONNECTICUT  
CT 00172  
JAN. 1981  
C-8

## **APPENDIX D**

### **HYDROLOGIC AND HYDRAULIC COMPUTATIONS**

LENARD & DILAJ ENGINEERING, INC.  
1066 Storrs Road  
STORRS, CONNECTICUT 06268  
(203) 429-7308

JOB ACME KILL LAKE  
SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_  
CALCULATED BY K. A. DATE \_\_\_\_\_  
CHECKED BY \_\_\_\_\_ DATE \_\_\_\_\_  
SCALE \_\_\_\_\_

DETERMINATION OF SPILLWAY TEST FLOOD\*

A. SIZE CLASSIFICATION

Based on either storage or height

THIS DAM:

<u>Small</u>	Storage 50-999 Ac.-Ft. Height 25-39 Ft.	<u>29 Ac.FT.</u> <u>10 FT.</u>
Intermediate	Storage 1,000-50,000 Ac.Ft. Height 40-100 Ft.	_____
Large	Storage More than 50,000 Ac.-Ft. Height Greater than 100 Ft.	_____

B. HAZARD POTENTIAL CLASSIFICATION

<u>Category</u>	<u>Loss of Life</u>	<u>Economic Loss</u>
Low	None expected	Minimal
Significant	Few	<u>Appreciable</u>
<u>High</u>	<u>More than few</u>	Excessive

Hazard Classification HIGH

C. HYDROLOGIC EVALUATION GUIDELINES

<u>Hazard</u>	<u>Size</u>	<u>Spillway Test Flood</u>
Low	Small Intermediate Large	50 to 100-Year Frequency 100-Year Frequency to $\frac{1}{2}$ PMF $\frac{1}{2}$ PMF to PMF
Significant	Small Intermediate Large	100-Year Frequency to $\frac{1}{2}$ PMF $\frac{1}{2}$ PMF to PMF PMF
<u>High</u>	<u>Small</u> Intermediate Large	<u><math>\frac{1}{2}</math> PMF to PMF</u> PMF PMF

Spillway Test Flood  $\frac{1}{2}$  PMF

\* Based upon "Recommended Guidelines for Safety Inspection of Dams" Department of the Army, Office of the Chief of Engineers, November 1976.



PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

```
1 RUNOFF-HYDROGRAPH AT
2 ROUTE HYDROGRAPH TO
3 RUNOFF-HYDROGRAPH AT
4 ROUTE-HYDROGRAPH TO
5 COMBINE 2 HYDROGRAPHS AT
6 RUNOFF HYDROGRAPH AT
7 COMBINE 2 HYDROGRAPHS AT
8 ROUTE HYDROGRAPH TO
9 RUNOFF HYDROGRAPH AT
10 COMBINE 2 HYDROGRAPHS AT
11 ROUTE HYDROGRAPH TO
11 END OF NETWORK
```

**WATERSHED ANALYSIS**

**ACME POND DAM**

X

FLOOD HYDROGRAPH PACKAGE (HEC-1)  
NAME SAFETY VERSION JULY 1978  
LAST MODIFICATION 26 FEB 79

RUN DATE 01/07/81.  
TIME 08.33.48.

ACME POND DAM EAST KILLINGLY CONNECTICUT  
80-27-1 NOVEMBER 1980-DESIGN STORM- $\frac{1}{2}$  TPMF

NQ	NIHR	NMIN	IDAY	SPECIFICATION			IPLT	IPRT	NSTAN
				IMR	IMIN	METHC			
150	0	30	0	0	0	0	0	4	0
			JOPER	NWT	LROP	TRACE			
			5	0	0	0			

MULTI-PLAN ANALYSES TO BE PERFORMED  
 NPLAN = 1 Nratio = 6 LRTIO = 1  
 .20 .30 .50 .80 1.00

SPFE PMS R6 R12 R24 R48 R72 R96  
 0.00 24.40 100.00 111.00 120.00 127.00 0.00 0.00  
 THE PROGRAM IS .800

SPFE PMS R6 R12 R24 R48 R72 R96  
 0.00 24.40 100.00 111.00 120.00 127.00 0.00 0.00  
 THE PROGRAM IS .800

STAKR DLTKR RT10L ERAIN STRKS RT10K STRTL CNSTL ALSMX RTIMP  
 0.00 0.00 1.00 0.00 0.00 1.00 1.00 .20 0.00 0.00

LLR0PT 0.00

UNIT HYDROGRAPH DATA

UNIT HYDROGRAPH 21 END-OF-PERIOD ORDINATES. LAG= 1.63 HOURS. CFS  
 23. 81. 145. 176. 161. 121. 90.  
 27. 20. 15. 11. 8. 6. 5.

END-OF-PERIOD FLOW  
COMP Q MO.D  
LOSS  
EXCS  
RAIN  
PERIOD  
HR.MN  
MO.DA

## 1. COMPUTER SYSTEMS



UNIT HYDROGRAPH 25 END-OF-PERIOD ORDINATES, LAG= 2.21 HOURS, CP= RTI0R= 1.00  
 STRTQ= -1.80 WRCSN= -.05 RECEDSION DATA  
 24. 85. 164. 227. 251. 226. 176.  
 67. 52. 41. 32. 25. 20. 15.  
 6. 4. 3. 2. 2.

END-OF-PERIOD FLOW CASH	1,000
0	0
100	100
200	200
300	300
400	400
500	500
600	600
700	700
800	800
900	900
1,000	1,000

SUM	24.79	19.28	5.51	42350.
	( 630. )	( 490. )	( 140. )	( 199.22 )

## HYDROGRAPH ROUTING

## ROUTED FLOW THROUGH KILLINGLY POND

ISIAQ ICOMP IECON 11

ROUTING DATA  
LINES, TSAME  
10

251.00	396.00	647.00	1059.00
--------	--------	--------	---------

00:45 580:00 5966:00 11/23:00

54.00 580.00 6069.00 17722.00

5

2

\*\*\*\*\*

## COMBINE HYDROGRAPHS

## COMBINE HYDROGRAPHS FROM ABOVE SUBBASINS 2 AND 4

INSTAG	ICCOMP	IECON	ITAPE	JPLT	INAME	ISTAGE	IAUTO
5	2	0	0	1	0	1	0

—

卷之三

## COMBINE HYDROGRAPHS

## COMBINE HYDROGRAPHS FROM ABOVE SUBBASINS 2



STAGE	562.00	563.00	564.00	564.30	566.00	568.00	570.00
FLOW	0.00	36.70	111.20	139.60	402.40	492.60	568.80
SURFACE AREA	60.	126.	170.	204.	227.	246.	262.
CAPACITY	0.	91.	238.	425.	640.	876.	1130.
ELEVATION	562.	563.	564.	565.	566.	567.	568.
CREL	562.0	SPWID	COQW	EXPW	ELEV	CQQL	CAREA
	0.0	0.0	0.0	0.0	0.0	0.0	EXPL

DAM DATA  
COGD EXPD DAMWID  
568.0 2.6 1.5 986.

PEAK OUTFLOW IS 108. AT TIME 48.50 HOURS

PEAK OUTFLOW IS 263. AT TIME 47.50 HOURS

PEAK OUTFLOW IS 420. AT TIME 48.50 HOURS

PEAK OUTFLOW IS 1611. AT TIME 46.00 HOURS

PEAK OUTFLOW IS 5968. AT TIME 44.00 HOURS

PEAK OUTFLOW IS 8600. AT TIME 43.50 HOURS

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*

#### SUBAREA RUNOFF COMPUTATION

##### CALCULATION OF INFLOW HYDROGRAPH TO ACME POND

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	I NAME	I STAGE	I AUTO
9	0	0	0	1	0	1	0	0

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	.39	0.00	.39	0.00	0.000	0	0	0

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	24.40	100.00	111.00	120.00	127.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .800

LRPRT	STRKR	DLTKR	RT10L	ERAIN	STRKS	RT10K	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.00	.20	0.00	0.00

TP= 1.70 CP= .63 NTA= 0

UNIT HYDROGRAPH DATA  
5  
UNIT COMPUTING SYSTEMS, INC.

RECEDITION DATA  
STARTZ -1.80 QRCNSZ -0.05 RTIORZ 1.00

UNIT HYDROGRAPH 19 END-OF-PERIOD ordinates. LAG= 1.70 HOURS. CP= .63 VOL= 1.00  
12. 44. 77. 90. 77. 56. 40. 29. 21.  
11. 8. 6. 3. 3. 2. 2. 1. 1.  
1. 4. 1. 1.

END-OF-PERIOD FLOW  
MO.DA HR.MN- PERIOD COMP Q MO.DA HR.MN- PERIOD LOSS

SUM 24.79 19.28 5.51 12426.  
( 630.)( 490.)( 140.)( 351.87)

#### COMBINE HYDROGRAPHS

COMBINE ABOVE TWO HYDROGRAPHS 8 AND 9

ISTAO 1COMP 2IECON ITAPE JPRT INAME IStage IAUTO  
10 1 0 0 1 0 1 0 0

#### HYDROGRAPH ROUTING

#### ROUTED FLOWS THROUGH ACME POND DAM

ISTAO	1COMP	IECON	ITAPE	JPRT	INAME	IStage	IAUTO
11	1	0	0	1	0	1	0
ROUTING DATA							
GLOSS	CLOSS	Avg	IRRES.	ISAME	10PT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0
NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-555.	-1

STAGE 555.00 556.00 557.00 558.00 558.20 560.00 562.00  
FLOW 0.00 -42.90 -119.90 221.20 -244.50 -499.10 -869.00

SURFACE AREA= 3. 4. 5. 5. 6. 7. 10. 12.

CAPACITY= 0. 3. 7. 12. 17. 22. 40. 62. 80. 102.

ELEVATION= 555. 556. 557. 558. 559. 560. 563. 566. 568. 570.

CREL	SPWID	COQW	EXPW	ELEV	COOL	CAREA	EXPL
555.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DAM DATA							
TOPEL	COQD	EXPU	DAMWID				
558.2	2.6	1.5	554.				

PEAK OUTFLOW IS 141. AT TIME 43.00 HOURS

PEAK OUTFLOW IS 311. AT TIME 42.00 HOURS

HYDRA FORMATTED BY CIVIL 10

(6)

• PEAK OUTFLOW IS 486. AT TIME 43.00 HOURS

• PEAK OUTFLOW IS 1664. AT TIME 46.00 HOURS

• PEAK OUTFLOW IS 6291. AT TIME 44.00 HOURS

• PEAK OUTFLOW IS 9161. AT TIME 43.50 HOURS

**PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS**  
**FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)**  
**AREA IN SQUARE MILES (SQUARE KILOMETERS)**

INFLUENCE	STATION	AREA	PLAN	RATIO .10	RATIO 1	RATIO 2	RATIO 3	RATIO 4	RATIO 5	RATIO 6	RATIOS APPLIED TO FLOWS	
											.20	.30
HYDROGRAPH AT	1 ( 2.12)	.82 (	1 (	204* ( 5.77) (	408* ( 11.55) (	612* ( 17.32) (	1019* ( 28.87) (	1631* ( 46.18) (	2039* ( 46.18) (	57.73) (		
ROUTED TO	2 ( 2.12)	.82 (	1 (	30* ( 85) (	60* ( 1.69) (	90* ( 2.54) (	666* ( 10.86) (	1585* ( 44.88) (	1997* ( 44.88) (	56.54) (		
HYDROGRAPH AT	3 ( 3.60)	1.39 (	1 (	313* ( 8.86) (	626* ( 17.73) (	939* ( 26.59) (	1565* ( 4.31) (	2504* ( 78.90) (	3130* ( 88.63) (	88.63) (		
ROUTED TO	4 ( 3.60)	1.39 (	1 (	27* ( 76) (	54* ( 1.52) (	306* ( 6.66) (	1017* ( 28.81) (	2175* ( 61.59) (	2813* ( 61.59) (	79.65) (		
2 COMBINED	5 ( 5.72)	2.21 (	1 (	56* ( 1.60) (	113* ( 3.19) (	395* ( 11.20) (	1647* ( 4.66) (	3549* ( 100.49) (	4641* ( 131.42) (	131.42) (		
HYDROGRAPH AT	6 ( 6.66)	2.57 (	1 (	559* ( 15.82) (	1117* ( 31.64) (	1676* ( 47.46) (	2793* ( 79.10) (	4469* ( 126.56) (	5587* ( 126.56) (	158.20) (		
2 COMBINED	7 ( 12.38)	4.78 (	1 (	592* ( 16.76) (	1184* ( 33.53) (	1776* ( 50.29) (	3818* ( 100.12) (	7920* ( 224.28) (	10105* ( 224.28) (	286.16) (		
ROUTED TO	8 ( 12.38)	4.78 (	1 (	108* ( 3.05) (	263* ( 7.45) (	420* ( 11.89) (	1611* ( 45.62) (	5968* ( 168.99) (	8600* ( 168.99) (	243.52) (		
HYDROGRAPH AT	9 ( 1.01)	.39 (	1 (	101* ( 2.85) (	201* ( 5.70) (	302* ( 8.54) (	503* ( 14.24) (	805* ( 22.78) (	1006* ( 22.78) (	28.48) (		
2 COMBINED	10 ( 13.39)	5.17 (	1 (	144* ( 4.08) (	296* ( 8.37) (	485* ( 13.73) (	1666* ( 47.19) (	6290* ( 176.12) (	9141* ( 176.12) (	238.84) (		
ROUTED TO	11 ( 13.39)	5.17 (	1 (	141* ( 4.01) (	311* ( 8.81) (	486* ( 13.80) (	1664* ( 47.13) (	6291* ( 178.15) (	9161* ( 178.15) (	259.40) (		

## EDDY PRAY RESERVOIR DAM

RATIO	FLOW, CFS	STAGE, FT	HOURS
.10	30.	570.3	46.00
.20	60.	571.7	46.00
.30	90.	573.0	46.00
<b>.50</b>	<b>666.</b>	<b>574.1</b>	<b>43.50</b>
<b>.80</b>	<b>1585.</b>	<b>574.4</b>	<b>42.00</b>
<b>1.00</b>	<b>1997.</b>	<b>574.5</b>	<b>42.00</b>

۶۰۰ میلیون دلار را در سال ۱۹۹۷ میلادی در این کشور ایجاد کرد.

PLAN I STATION 4

**KILLINGLY POND DAM**

AMOUNT	CHARGE	DISBURSE	REBATE	AMOUNT
.10	27.	588.0	48.00	
.20	54.	589.0	48.00	
.30	306.	589.5	45.50	
.50	1017.	590.2	64.00	
.80	2175.	590.6	43.00	
1.00	2813.	590.8	43.00	

## MIDDLE RESERVOIR DAM

### SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	562.00	562.00	568.00
STORAGE	0.	0.	1130.
OUTFLOW	0.	0.	493.

RATIO OF RESERVOIR PMF W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
0.10	563.95	0.00	230.	108.	0.00	48.50
0.20	565.10	0.00	445.	263.	0.00	47.50
0.30	566.39	0.00	729.	420.	0.00	48.50
0.50	568.57	57	1281.	1611.	10.00	46.00
0.80	569.65	1.65	1579.	5986.	18.50	44.00
1.00	570.14	2.14	1721.	8600.	33.50	43.50

(D)

# ACME POND DAM

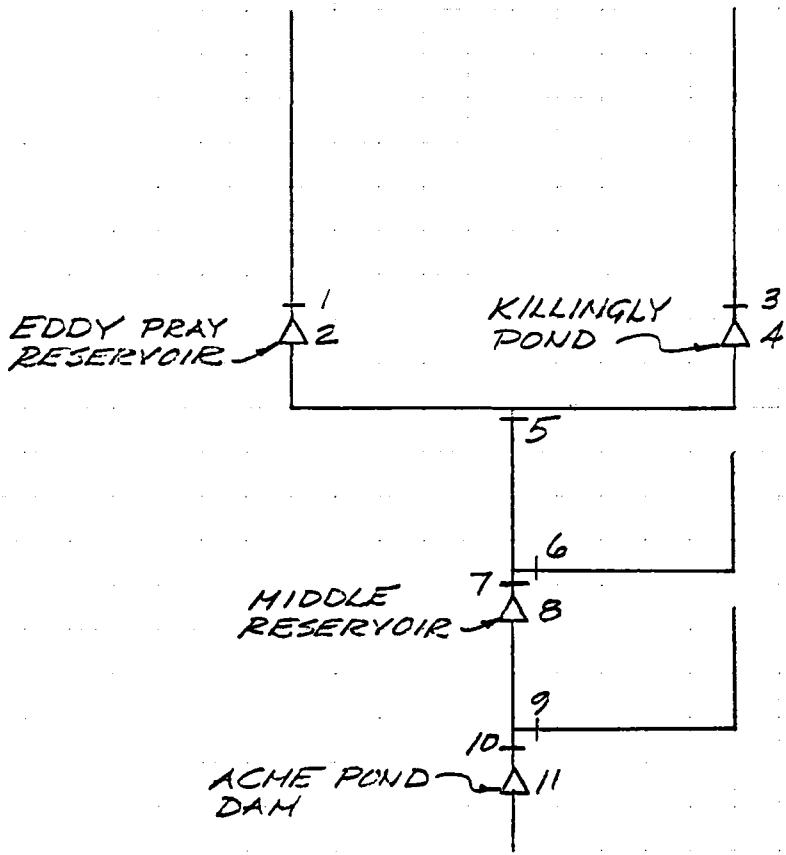
## SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1			INITIAL VALUE	SPILLWAY CREST	TOP OF DAM	TIME OF FAILURE
	ELEVATION OVER STORAGE OUTFLOW		555.00	555.00	558.20	0.00
RATIO OF PMF W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT		MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	MAX OUTFLOW HOURS
.10	557.21	0.00	8.	141.	0.00	43.00
.20	558.31	.11	13.	311.	13.00	42.00
.30	558.48	.28	14.	448.	34.50	43.00
.50	559.14	.94	17.	1664.	36.00	46.00
.80	560.72	2.52	26.	6231.	36.50	44.00
1.00	561.48	3.28	31.	9161.	37.00	43.50

LENARD & DILAJ ENGINEERING, INC.  
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(203) 429-7308

JOB ACME POND DAM  
SHEET NO. 1 OF 15  
CALCULATED BY M. D. DATE 12/29/80  
CHECKED BY K. A. DATE 12/30/80  
SCALE \_\_\_\_\_

## SCHEMATIC



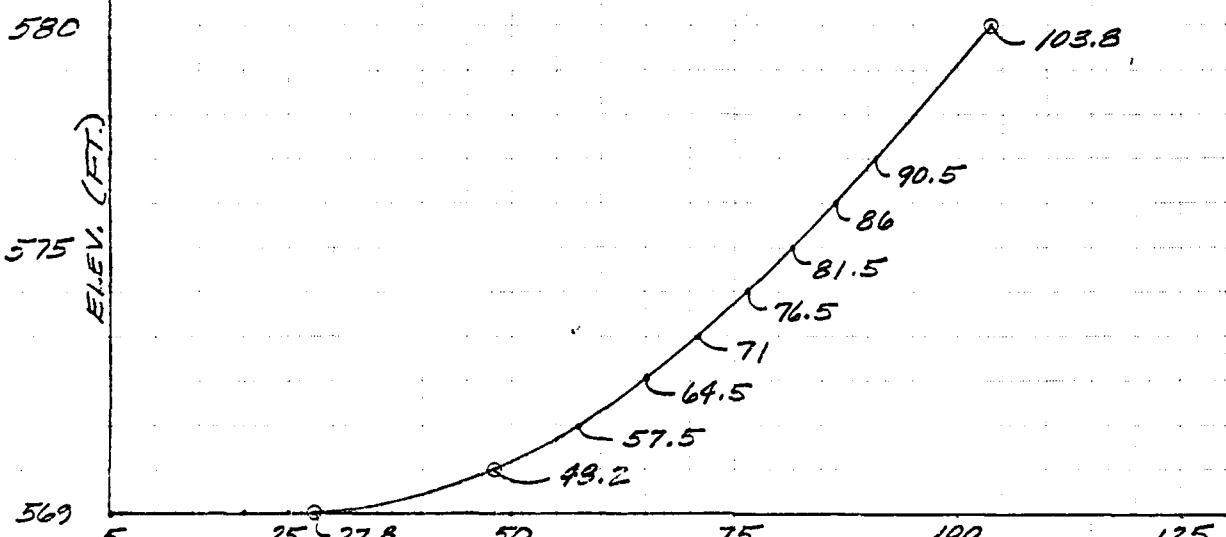
- 1 - RUNOFF EDDY PRAY WATERSHED
- 2 - ROUTED INFLOW THROUGH EDDY PRAY RESERVOIR
- 3 - RUNOFF KILLINGLY POND
- 4 - ROUTED INFLOW THROUGH KILLINGLY POND
- 5 - COMBINE ABOVE TWO FLOWS
- 6 - RUNOFF MIDDLE RESERVOIR WATERSHED
- 7 - COMBINE FLOWS 5 & 6
- 8 - ROUTED INFLOW 7 THROUGH MIDDLE RESERVOIR
- 9 - RUNOFF ACME POND WATERSHED
- 10 - COMBINE FLOWS 8 & 9
- 11 - ROUTED INFLOW 10 THROUGH ACME POND DAM

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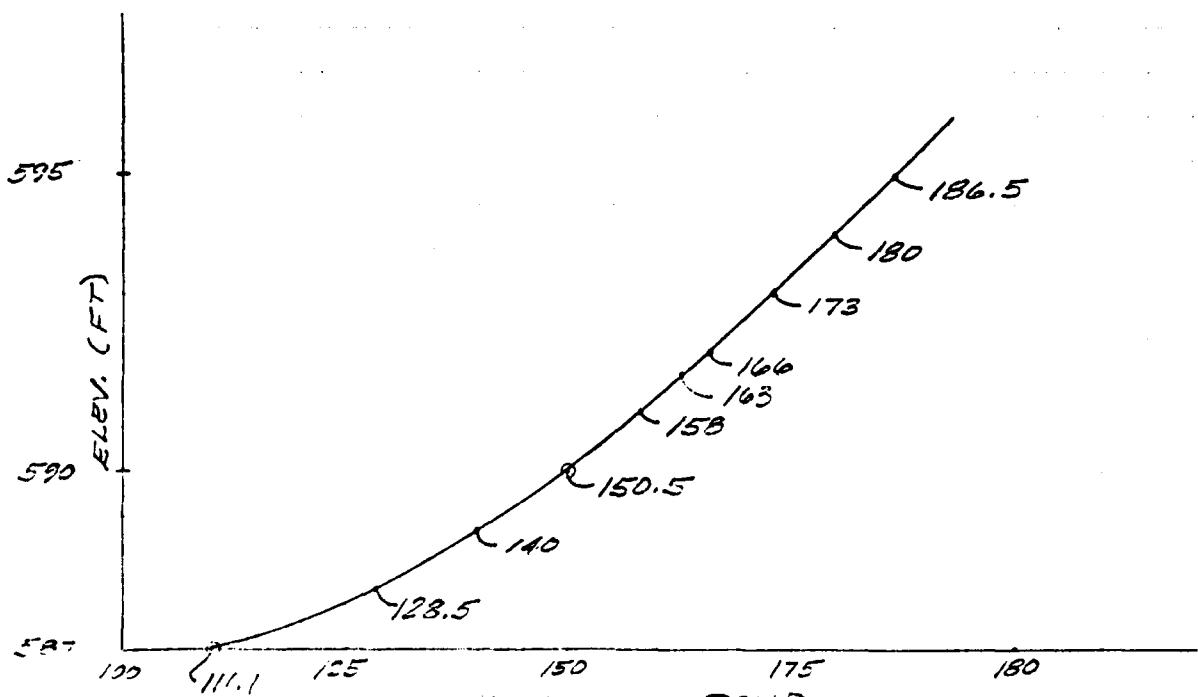
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STORRS, CONNECTICUT 06268  
(203) 429-7308

JOB Corps - Acme Pond  
SHEET NO. 2 OF 15  
CALCULATED BY MD DATE 12/29/80  
CHECKED BY K.A. DATE 12/30/80  
SCALE \_\_\_\_\_

© CALC. POINTS  
OFF USGS  
QUAD. SHEETS



EDDY PRAY RESERVOIR  
SURFACE AREA (AC.)



KILLINVILLE POND  
SURFACE AREA (AC.)

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JOB ACME POND DAM  
SHEET NO. 3 OF 15  
CALCULATED BY MD DATE 12/29/80  
CHECKED BY K.A. DATE 12/30/80  
SCALE

LAG TIME CALC. (SNYDER'S METHOD)

KILLINGLY POND:  $L = 10,650 \text{ FT.} = 2.02 \text{ MI.}$   
 $L_{CA} = 3,650 \text{ FT.} = 0.69 \text{ MI.}$   
 $C_t = 2.0$

$$t_p = C_t (L L_{CA})^{0.3}$$
$$t_p = 2.21 \text{ HRS.}$$

EDDY PEAY RESERVOIR:

$L = 7,100 \text{ FT.} = 1.34 \text{ MI.}$   
 $L_{CA} = 2,900 \text{ FT.} = 0.55 \text{ MI.}$   
 $C_t = 2.0$

$$t_p = C_t (L L_{CA})^{0.3}$$
$$t_p = 1.82 \text{ HRS.}$$

MIDDLE RESERVOIR:

$L = 12,850 \text{ FT.} = 2.43 \text{ MI.}$   
 $L_{CA} = 3,900 \text{ FT.} = 0.74 \text{ MI.}$   
 $C_t = 2.0$

$$t_p = C_t (L L_{CA})^{0.3}$$
$$t_p = 2.38$$

DRAINAGE AREAS:

KILLINGLY POND:  $\frac{5142}{4585} \frac{557}{559} \frac{558}{559} = 1.27 \text{ S.M.}$

$\frac{5120}{5173} \frac{53}{52} = 0.12 \text{ S.M.}$   
 $\frac{5224}{5224} \frac{51}{51} = 1.00 \text{ S.M.}$

TOTAL = 1.39 S.M.

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JOB ACME POND DAM  
SHEET NO. 4 OF 15  
CALCULATED BY MD DATE 12/29/80  
CHECKED BY K. A. DATE 12/30/80  
SCALE \_\_\_\_\_

DRAINAGE AREAS CONT'D

EDDY POND RESERVOIR :

5392	322		
5070	326	324	359.5 =
5394			
5224	9	10	
5215			<u>0.82 S.M.</u>
5226	11		
5087	25		
5062	26	25.5	
5088			

MIDDLE RESERVOIR :

6216	1128		
7344	1120	1124 = 2.57 S.M.	
8464			

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JOB ALICE POND DR.  
SHEET NO. 5 OF 15  
CALCULATED BY Hodgkins DATE Dec 31 80  
CHECKED BY K.A. DATE 1/2/81  
SCALE \_\_\_\_\_

DISCHARGE - ELLY KING REC.

ELEV.	C	L	$\Delta L$	$h_n$	$h_n^{1.5}$	$\sum h_n^{1.5}$	$Q = C_d L \sum h_n^{1.5}$
574.0	2.6	1315'	1040	0.16	0.044	173.06	
			90	0.20	0.089	20.85	
			85	0.26	0.132	29.4	
			100	0.15	0.053	15.1	
							$\sum Q = 238.4$
574.5	2.6	1525'	1040	0.14	0.536	1449.3	
			90	0.70	0.586	157.1	
			85	0.76	0.663	146.5	
			100	0.65	0.524	136.2	
			210	0.50	0.254	193.0	
							$\sum Q = 2062.1$
575.0	2.6	1550'	1050	1.66	2.14	5342.2	
			90	1.70	2.22	579.5	
			85	1.76	2.33	514.9	
			100	1.65	2.12	551.2	
			215	1.50	1.84	1028.6	
							$\sum Q = 8456.4$
575.5							

## LENARD & DILAJ ENGINEERING, INC.

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JOB ACME POND DAM SHEET NO. 6 OF 15  
CALCULATED BY G.R. DATE 1/5/81  
CHECKED BY K.A. DATE 1/6/81

KILLINGLY POND-DISCHARGE CHECK  
SCALE

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(203) 429-7308

## KILLINLY POND- DISCHARGE

JOB ACME POND DASH  
SHEET NO. 7 OF 15  
CALCULATED BY C DATE 1-5-81  
CHECKED BY K.A. DATE 1/6/81  
SCALE 1/100

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JOB ACME POND DAM  
SHEET NO. 8 OF 15  
CALCULATED BY G.P. DATE 1-5-81  
CHECKED BY K.A. DATE 1/6/81  
SCALE \_\_\_\_\_

KILLINGLY POND. DISCHARGE

<u>IN.U.</u>	<u>ELEV.</u>	<u>HW</u>	<u>HW/D</u>	<u>Q/PIPE</u>	<u>Q</u>
Z-12"					
S86.7	S87	0.3	0.2	1.2	2.4
	S88	1.3	0.9	3.8	11.6
	S89	2.3	1.7	12.5	25.0
3-18"					
S87.0	S87	0	0	0	0
	S88	1.0	.7	3.8	11.4
	S89	2.0	1.3	9.5	28.5
1-30"					
S71.1	S87	15.9	6.4	110	110
	S88	16.9	6.8	115	115
	S89	17.9	7.2	120	120

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JOB ACME HILL 1011  
 SHEET NO. 9 OF 15  
 CALCULATED BY K. A. DATE 12/29/80  
 CHECKED BY M. D. DATE 12/29/80  
 SCALE \_\_\_\_\_

## STORAGE

### ELLIP. POND

<u>Elev.</u>	<u>AREA</u>	<u>Ave.</u>	<u>ΔH</u>	<u>ΔS</u>	<u>STOTAL (AC.FT.)</u>
569	27.8				0
573.5	74.0	50.9	4.5	229	229
574.0	76.2	75.3	0.5	37.7	37.7
574.5	72.0	77.8	0.5	38.3	38.3
575.5	840	81.5	1.0	81.5	81.5
					387

### KILLINGLY POND

<u>Elev.</u>	<u>Area</u>	<u>Ave.</u>	<u>ΔH</u>	<u>ΔS</u>	<u>STOTAL (AC.FT.)</u>
587	111.1				0
589	140	125.6	2	251.2	251
590	150.5	145.3	1	145.3	396
591.6	163	156.8	1.6	250.9	647
594.0	180	171.5	2.4	411.6	1059

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JOB Storrs - Acme Pond  
SHEET NO. 10 OF 15  
CALCULATED BY MJR DATE 11/20/80  
CHECKED BY MD DATE 11/25/80  
SCALE \_\_\_\_\_

STORRS ABOVE CROWN FOR MIDDLE RECKNOK

WATER SURFACE AREA @ EL 36.3

READINGS 6326 87  
6913 35.5 AVE 860 x 63,654.43560  
7084 140 = 125.7 AC.  
7224 139  
7502

AREA @ EL 36.5

READINGS 7084 140  
7224 139 AVE 139.3 x 63,654.43560  
7502 = 203.6 AC.

AREA @ EL 570

READINGS 7502 198  
7703 137 AVE 197.3 x 63,654.43560  
8084 = 283.3 AC.

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JOB COKPS - ACME -75  
SHEET NO. 11 OF 15  
CALCULATED BY MD DATE 11/20/80  
CHECKED BY MD DATE 11/25/80  
SCALE \_\_\_\_\_

570

569

568

567

566

565

564

563

© CALC. POINTS  
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SHEETS.

288.3

281

275

269

262

255

246

237

227

216

203.6

183

170

150

125.7

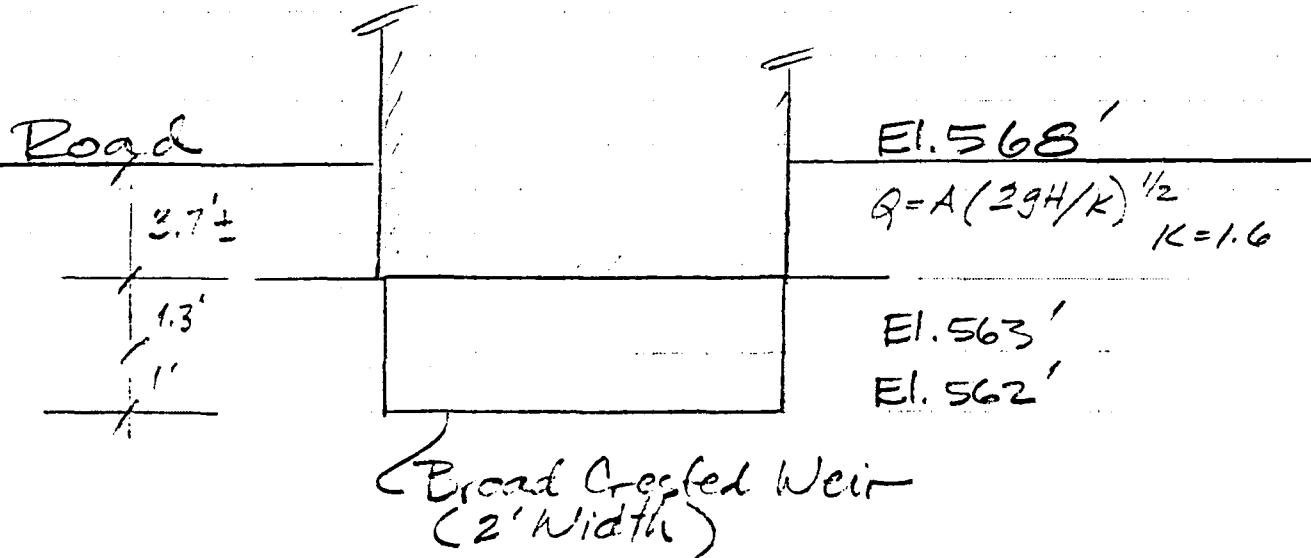
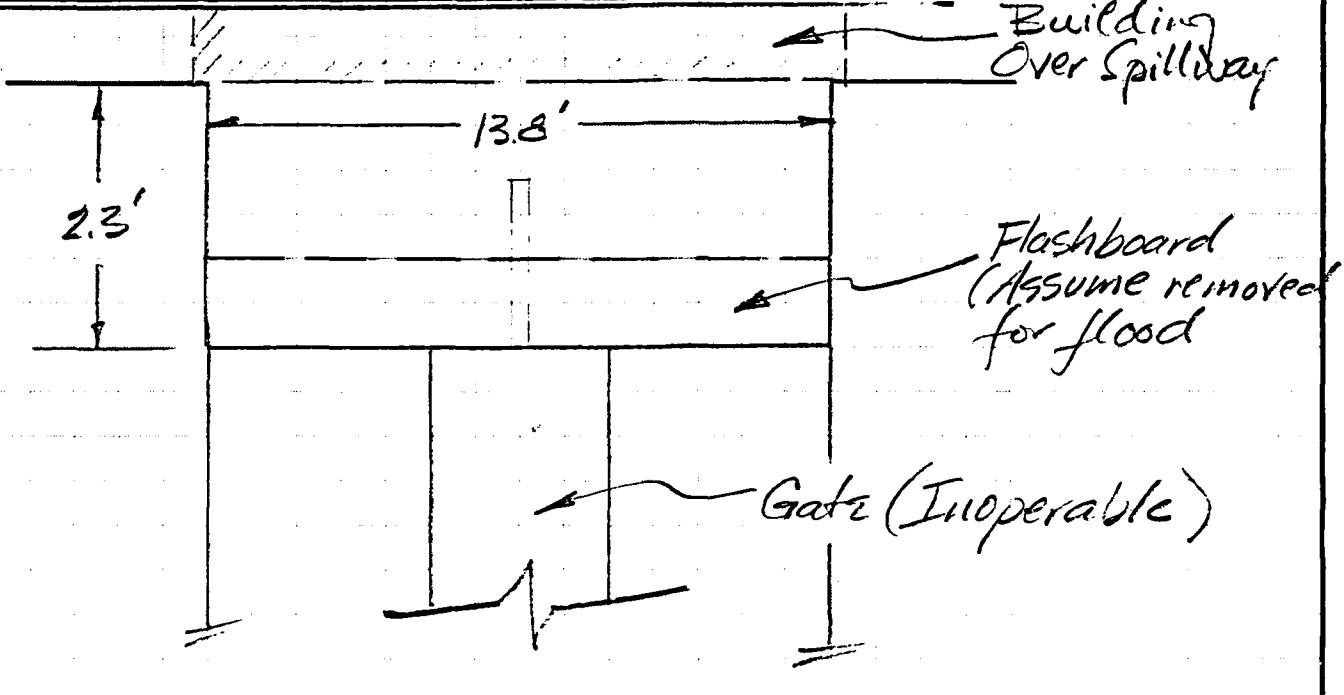
MIDDLE RIVER, DAM

SURFACE AREA - ACRES

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JOB ACME POND DAM  
SHEET NO. 12 OF 15  
CALCULATED BY ICA DATE 11-20-80  
CHECKED BY MD DATE 11-25-80  
SCALE \_\_\_\_\_

SPILLWAY - MIDDLE RESERVOIR

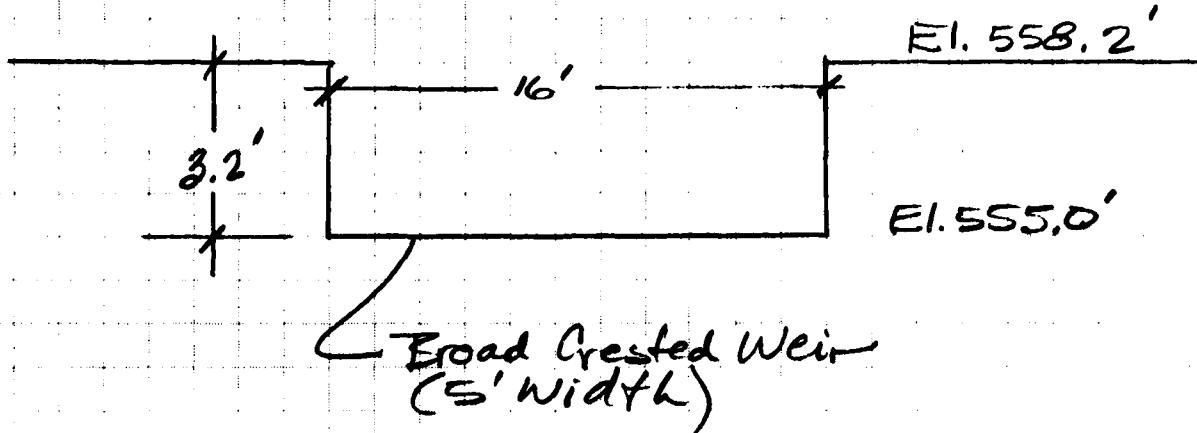


$$\begin{aligned} \text{length of dam} = L &= \text{Total - Spillway} \\ &= 1000' - 14 \\ L &= 986' \end{aligned}$$

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JOB ACME POND - 1A1  
SHEET NO. 13 OF 15  
CALCULATED BY KA DATE 11-20-80  
CHECKED BY MD DATE 11-25-80  
SCALE \_\_\_\_\_

SPILLWAY - ACME POND DAM



MIDDLE RESERVOIR - SPILLWAY CAPACITY\*

<u>Elev.</u>	<u>C</u>	<u>L</u>	<u>H</u>	$Q = CLH^{1.5} (\text{cfs})$
562	2.5	13.8	0	0
563	2.66	"	1	36.7
564	2.85	"	2	111.2
564.3	2.9	"	2.3	139.6
<u>Elev.</u>	<u>K</u>	<u>A</u>	<u>H</u>	$Q = A(2gH/K)^{1/2}$
566	1.6	31.7	1.7	262.2
568	1.6	"	3.1	386.9
570	1.6	"	5.7	480.2

\*ASSUME GATE IS CLOSED.

ACME POND - SPILLWAY CAPACITY

<u>Elev.</u>	<u>C</u>	<u>L</u>	<u>H</u>	$Q = CLH^{1.5} (\text{cfs})$
555.0	2.34	16'	0	0
556.0	2.68	"	1	42.9
557.0	2.65	"	2	119.7
558.0	2.66	"	3	221.2
558.2	2.67	"	3.2	244.5
560.0	2.79	"	5	499.1
562.0	3.0	"	7	889.0
	3.0	16	4.1	398.5

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JOB ACME POND DAM  
SHEET NO. 14 OF 15  
CALCULATED BY K. A. DATE 11/12/80  
CHECKED BY MD DATE 11/25/80  
SCALE \_\_\_\_\_

PMP 6-HOUR PRECIPITATION

24.4 INCHES

FROM WEATHER BUREAU  
TECH. PAPER NO. 40

ACME POND - WATERSHED AREA

$$\begin{matrix} 168 \text{ grads} \\ 170 \text{ grads} \end{matrix} \Rightarrow 0.386 \text{ S.M.}$$

0.39 S.M.

ACME POND - LAG TIME (SNYDER'S)

$$L = 6300 \text{ ft.} = 1.19 \text{ MI.}$$

$$L_{CA} = 2600 \text{ ft.} = 0.49 \text{ MI.}$$

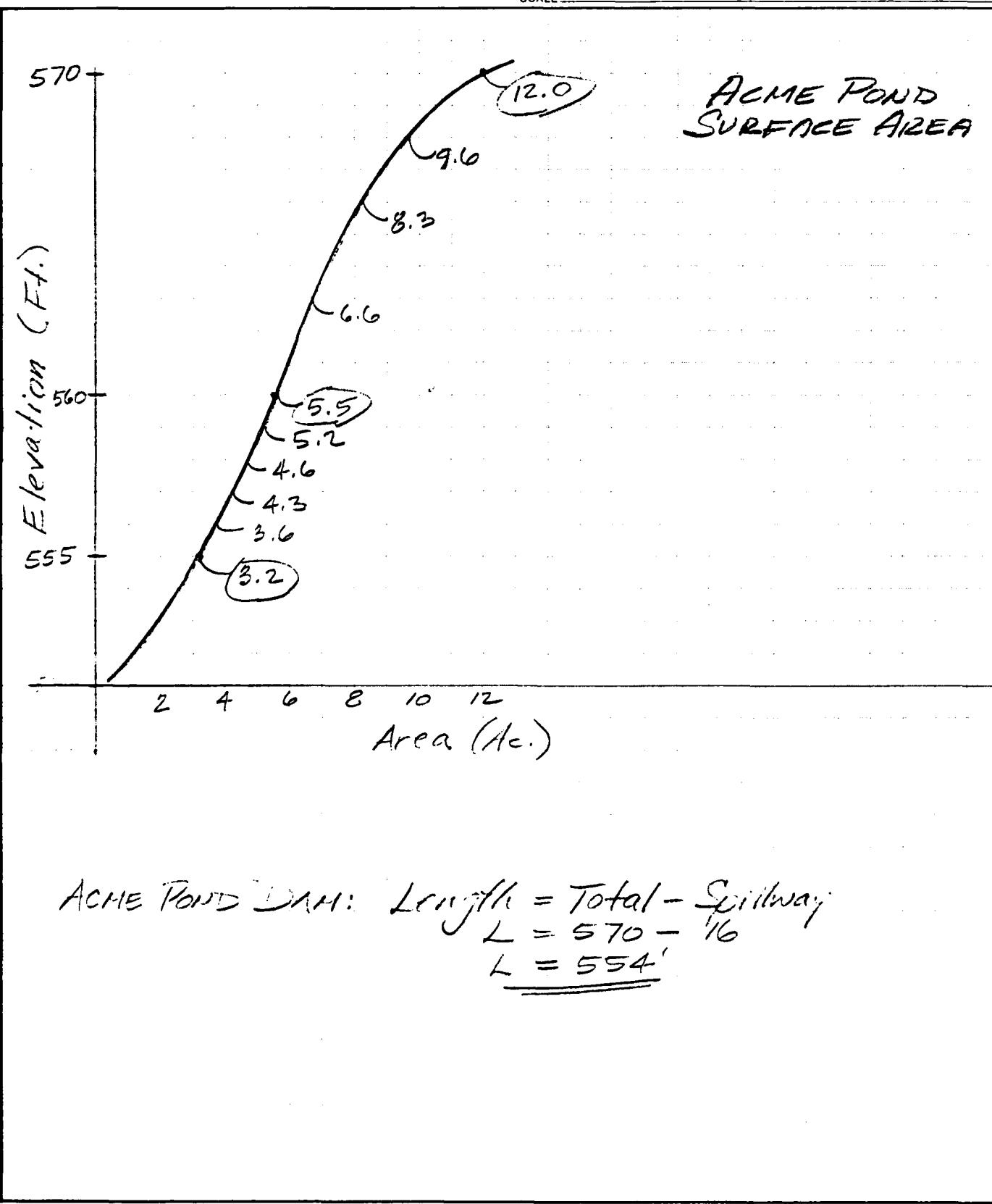
$$C_t = 2.0$$

$$\begin{aligned} t_p &= C_t (L L_{CA})^{0.3} \\ &= 2.0 (1.19 \times 0.49)^{0.3} \end{aligned}$$

$t_p = 1.70 \text{ HRS.}$

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JOB ACME POND DAM  
SHEET NO. 15 OF 15  
CALCULATED BY K. A. DATE 11-24-80  
CHECKED BY M. D. DATE 11-25-80  
SCALE \_\_\_\_\_



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JOB ACME Pond Dam  
SHEET NO. 1 OF 9  
CALCULATED BY Meh DATE 1/6/81  
CHECKED BY M.C. DATE 1/7/81  
SCALE \_\_\_\_\_

ACME Pond Dam - Dam Breach

$S$  = STORAGE AT TIME OF FAILURE

$$= 23 \text{ ac. ft.}$$

$Q_p$  = PEAK FAILURE OUTFLOW

$$= \frac{2}{3} \pi W_b \sqrt{g} V_o^{3/2}$$

$W_b$  = BREACH WIDTH; 40% OF DAM LENGTH AT MID HEIGHT

$$= 10.40 \times 5.00 = 200'$$

$V_o$  = TOTAL HEIGHT FROM RIVER BED TO POOL  
LEVEL AT TIME OF FAILURE

$$= 10.0 \text{ ft.}$$

$$Q_p = \frac{2}{3} \pi (200)(\sqrt{32.2})(10.0)^{3/2}$$

$$= 12,400 \text{ c.f.s.}$$

AD-A143 310

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS  
ACME POND DAM CT 0817. (U) CORPS OF ENGINEERS WALTHAM  
MA NEW ENGLAND DIV MAR 81

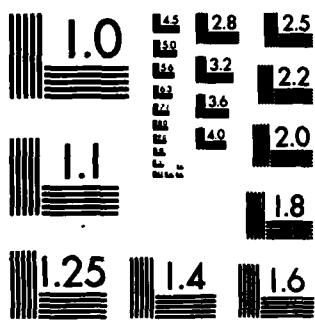
2/2

UNCLASSIFIED

F/G 13/13

NL





MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

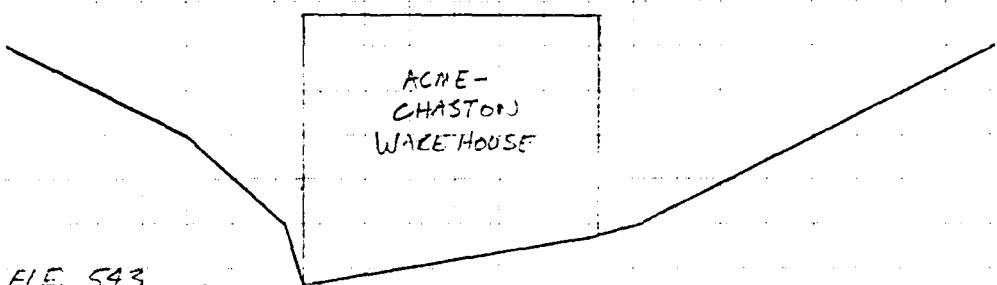
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JOB ACME POLE A-SECTIONS  
SHEET NO. 2 OF 9  
CALCULATED BY M.H. DATE 12-31-80  
CHECKED BY M.Z. DATE 1/7/81  
SCALE \_\_\_\_\_

SECTION #1

HOR: 1" = 200'  
VERT: 1" = 20'



<u>H</u>	<u>A</u>	<u>WP</u>	<u>R</u>	<u>V</u>	<u>Q</u>
7	108	78	1.4	10.35	1118
9	230	142	2.0	13.13	3809
11	605	213	2.8	16.43	9940 -
12	658	263	3.3	18.34	15,736 --
13	1160	340	3.4	18.71	21,704

N = 3.053

S = 1.317

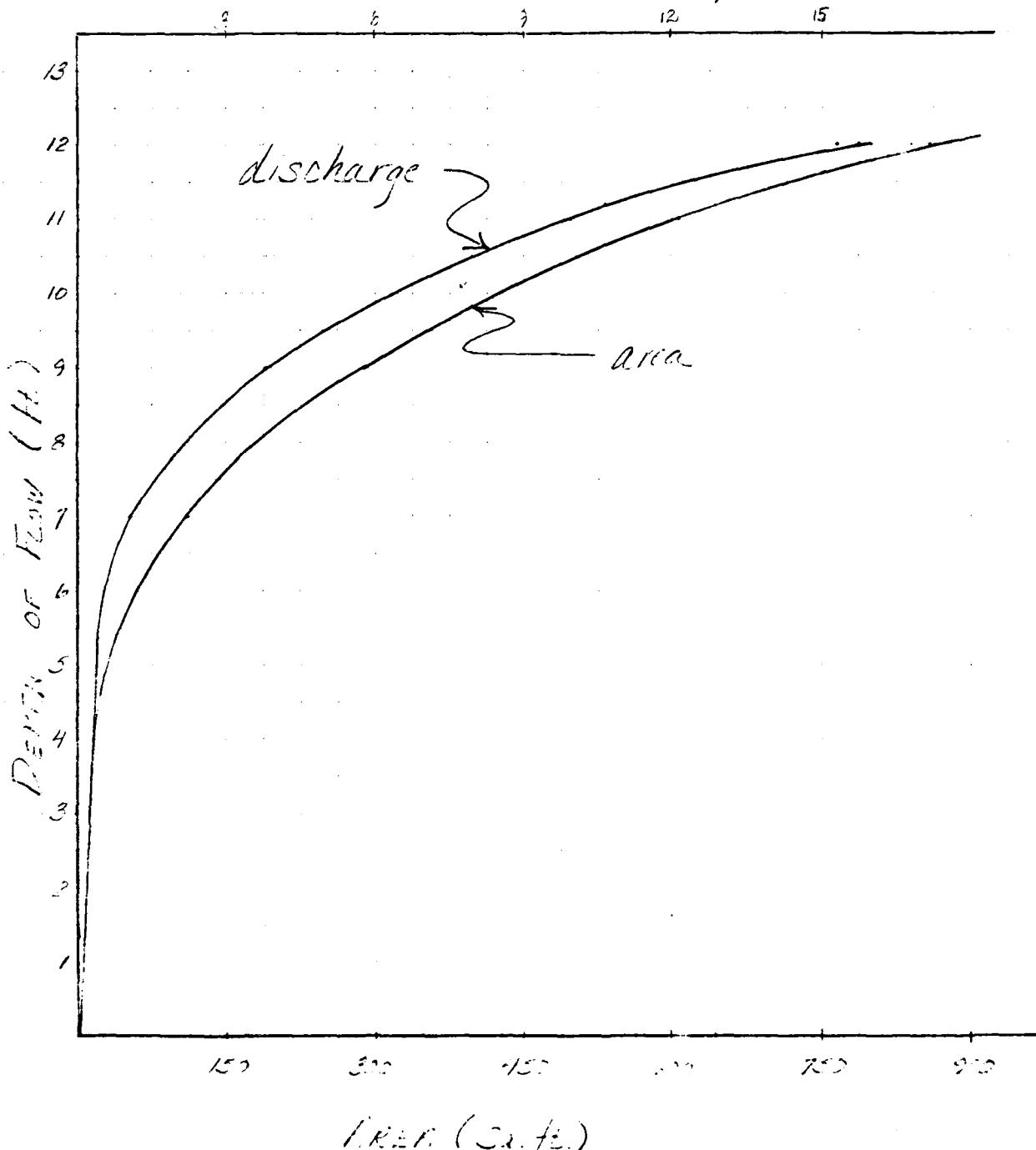
L = 1.5'

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JOB ACME POND DAM  
SHEET NO. 3 OF 9  
CALCULATED BY MH DATE 1/6/91  
CHECKED BY ML DATE 1/7/91  
SCALE \_\_\_\_\_

ACME POND DAM - SECTION 1

DISCHARGE (1000 cfs)



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JOB WME POND DMR  
SHEET NO. 4 OF 9  
CALCULATED BY M.H. DATE 1/6/81  
CHECKED BY R.Z. DATE 1/7/81  
SCALE \_\_\_\_\_

## FLOOD ROUTING SECTION 1

$n_1$  = MANNING COEFFICIENT = 0.050

$S$  = STORAGE AT TIME OF FAILURE = 23 ac.ft

$L_1$  = LENGTH OF REACH = 65 ft

$Q_{p1}$  = INFLOW INTO REACH = 10,600 cfs

$H_1$  = DEPTH OF FLOW = 11.2 ft.

$A_1$  = CROSS SECTIONAL AREA = 645 sq.ft.

$V_1$  = STORAGE IN REACH = 96 ac.ft.

$Q_{p2}$  (TRIAL) = TRIAL REACH OUTFLOW = 10,160 cfs

$H_2$  (TRIAL) = TRIAL DEPTH OF FLOW = 11.5 ft

$A_2$  (TRIAL) = TRIAL CROSS SECTIONAL AREA = 618

$V_2$  (TRIAL) = TRIAL STORAGE IN REACH = 91 ac.ft.

$Q_{p2}$  = REACH OUTFLOW = 10,200 cfs

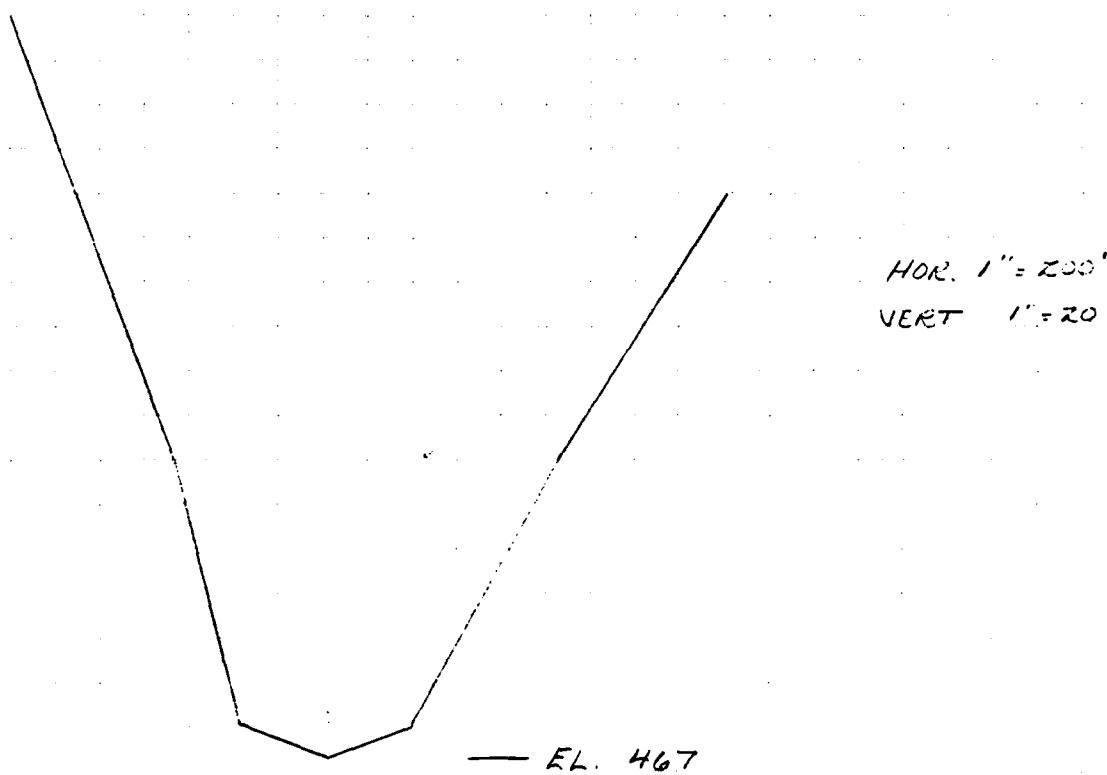
$H_2$  DEPTH OF FLOW = 11.7 ft

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1066 Storrs Road  
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JOB ACME POND X-SECTION  
SHEET NO. 5 OF 9  
CALCULATED BY G.R.B DATE 1-5-71  
CHECKED BY M.R DATE 1-5-71  
SCALE \_\_\_\_\_

## SECTION #2 - ACME POND



— EL. 467

<u>z</u>	<u>F</u>	<u>WF</u>	<u>F</u>	<u>V</u>	<u>Q</u>
3	270	180	1.5	13.53	3653
4	460	170	2.4	18.51	8515
5	672	200	3.4	23.35	15,691
6	782	210	3.7	24.71	19,323
7	1072	220	4.2	21.80	32,542

n = 0.025

S = 0.01

L = 100

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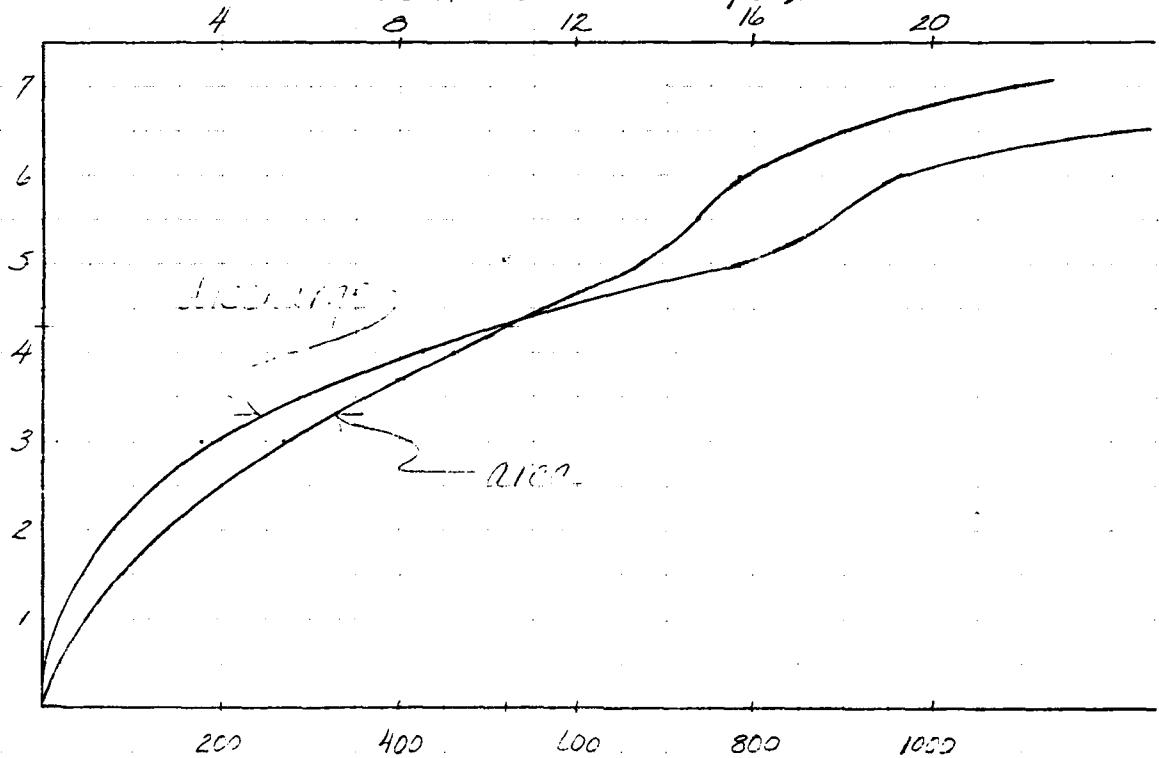
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(203) 429-7308

JOB Acme Pond Driv

SHEET NO. 6 OF 9  
CALCULATED BY MH DATE 1/6/31  
CHECKED BY MZ DATE 1/7/31  
SCALE \_\_\_\_\_

Acme Pond Driv - SECTION 2

DISCHARGE (1000 cfs)



AREA (sq. ft.)

## LENARD &amp; DILAJ ENGINEERING, INC.

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(203) 429-7308

JOB 100-1000  
SHEET NO. 7 OF 9  
CALCULATED BY M.L. DATE 1/1/81  
CHECKED BY M.L. DATE 1/7/81  
SCALE \_\_\_\_\_

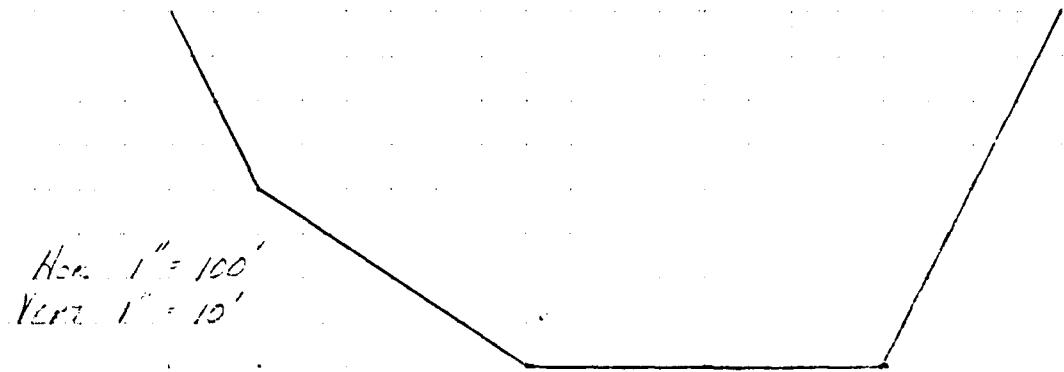
## FLOOD ROUTING SECTION 2

$n_2$  = MANNING COEFFICIENT = 0.030  
 $S$  = STORAGE AT TIME OF FAILURE = 22 ac.ft.  
 $L_2$  = LENGTH OF REACH = 600 ft.  
 $Q_{P2}$  = INFLOW INTO REACH = 12,200 cfs  
 $h_2$  = DEPTH OF FLOW = 4.3 ft.  
 $A_2$  = CROSS SECTIONAL AREA = 520 sq.ft.  
 $V_2$  = STORAGE IN REACH = 7.8 ac.ft.  
 $Q_{P3}$  (TRIAL) = TRIAL REACH OUTFLOW = 6,800 cfs.  
 $h_2$  (TRIAL) = TRIAL DEPTH OF FLOW = 3.7 ft.  
 $A_2$  (TRIAL) = TRIAL CROSS SECTIONAL AREA = 400 sq.ft  
 $V_2$  (TRIAL) = TRIAL STORAGE IN REACH = 6.0 ac.ft.  
 $Q_{P3}$  = REACH OUTFLOW = 7,100 cfs  
 $h_2$  = DEPTH OF FLOW = 3.8 ft.

LENARD & DILAJ ENGINEERING, INC.  
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 STORRS, CONNECTICUT 06268  
 (203) 429-7308

JOB Acme Pond Dam  
 SHEET NO. 8 OF 9  
 CALCULATED BY Mell DATE 1/6/31  
 CHECKED BY ML DATE 1/7/31  
 SCALE \_\_\_\_\_

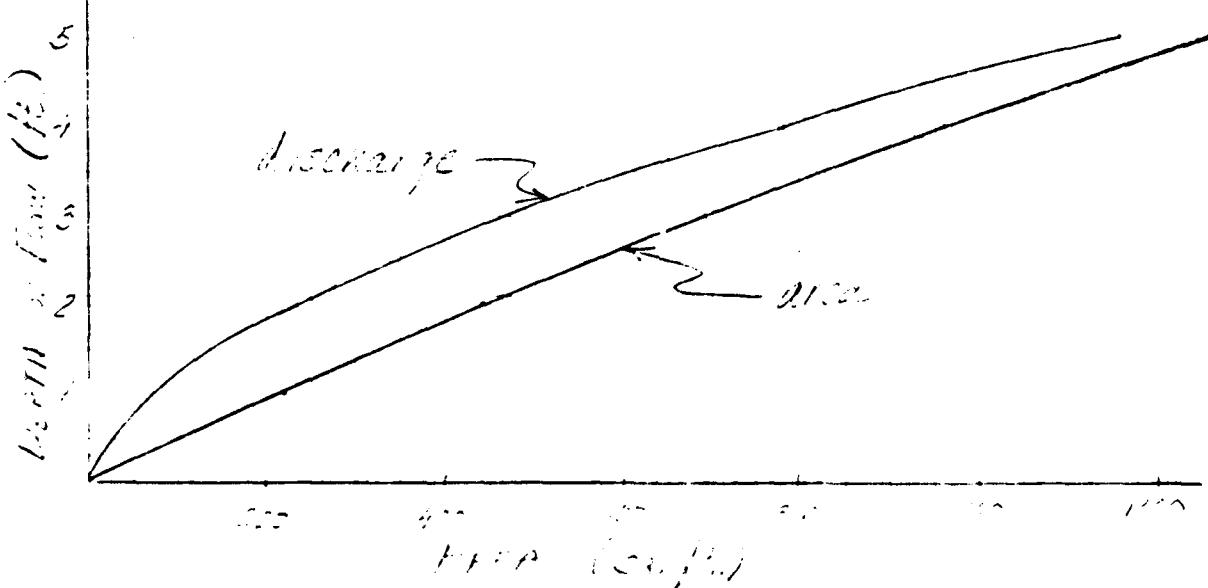
Acme Pond Dam - Section 3



<u>H</u>	<u>H'</u>	<u>WP</u>	<u>R</u>	<u>V</u>	<u>Q</u>
1	310	220	.75	3.4	725
2	440	240	1.83	5.3	3352
3	670	260	2.65	6.8	4726
4	960	280	3.43	8.1	7637
5	1250	301	4.15	9.2	11525

DISCHARGE (1000 cfs)

2 4 6 8 10 12

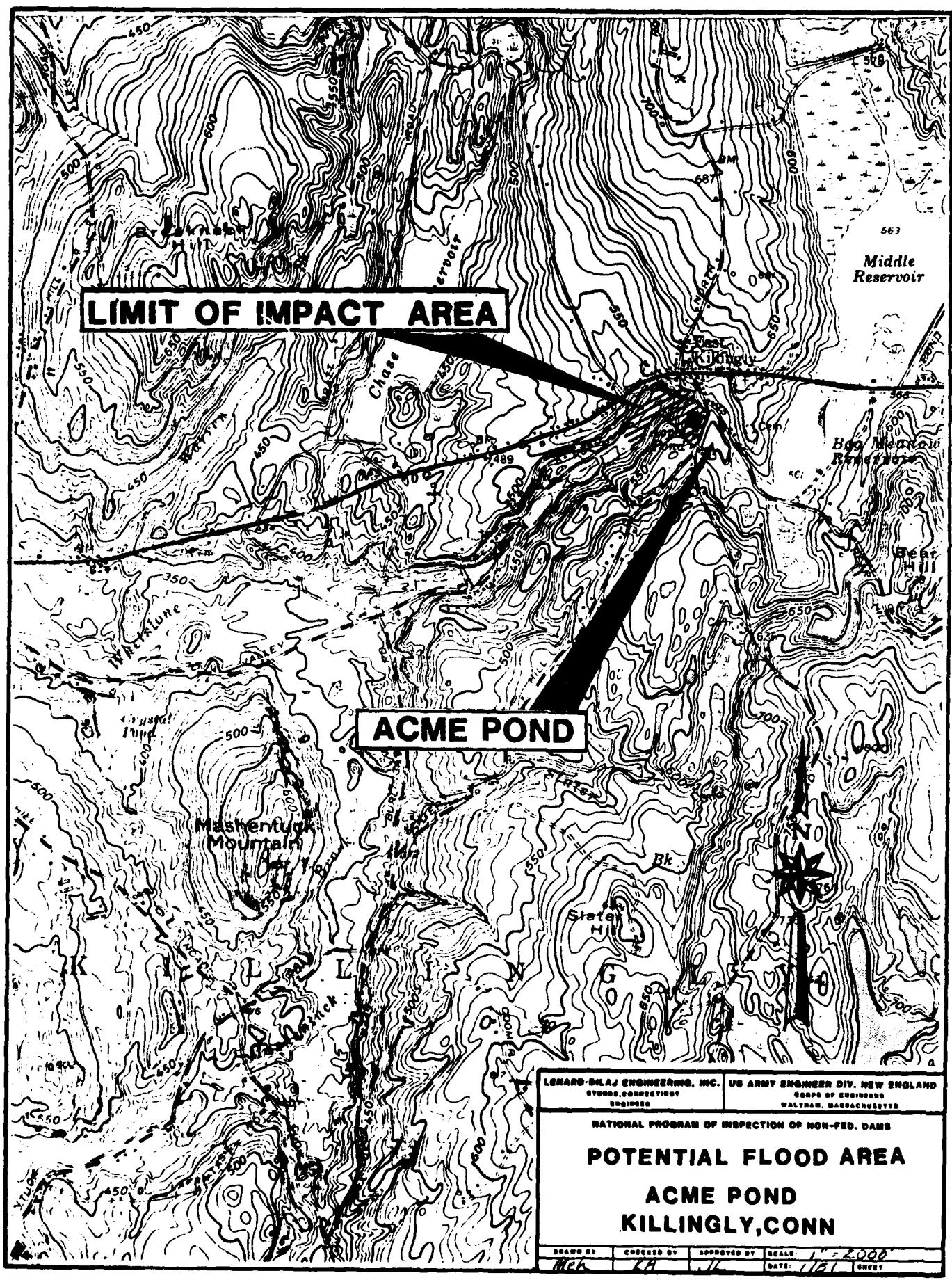


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JOB Line 1000 Dam  
SHEET NO. 9 OF 9  
CALCULATED BY Meb DATE 1/6/81  
CHECKED BY MZ DATE 1/7/81  
SCALE \_\_\_\_\_

### FLOOD ROUTING SECTION 3

$n_g$  = MANNING COEFFICIENT = 0.050  
 $S$  = STORAGE AT TIME OF FAILURE = 23 ac.ft.  
 $L_g$  = LENGTH OF REACH = 100 ft  
 $Q_{p3}$  = INFLOW INTO REACH = 7160 cfs  
 $H_g$  = DEPTH OF FLOW = 3.9 ft  
 $A_g$  = CROSS SECTIONAL AREA = 9203.7 ft<sup>2</sup>  
 $V_g$  = STORAGE IN REACH = 14.3 ac.ft  
 $Q_{p4}$  (TRIAL) - TRIAL REACH OUTFLOW = 2560 cfs  
 $H_g$  (TRIAL) - TRIAL DEPTH OF FLOW = 2.1  
 $A_g$  (TRIAL) - TRIAL CROSS SECTIONAL AREA = 4653 ft<sup>2</sup>  
 $V_g$  (TRIAL) - TRIAL STORAGE IN REACH = 9.5 ac.ft.  
 $Q_{p4}$  REACH OUTFLOW = 3700  
 $H_g$  DEPTH OF FLOW = 3.6



LEONARD-BLAJ ENGINEERING, INC.	US ARMY ENGINEER DIV. NEW ENGLAND		
STORRS, CONNECTICUT	CORPS OF ENGINEERS		
ENGINEERS	WALTHAM, MASSACHUSETTS		
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS			
<b>POTENTIAL FLOOD AREA</b>			
<b>ACME POND</b>			
<b>KILLINGLY, CONN</b>			
DRAWN BY	CHECKED BY	APPROVED BY	SCALE:
MKA	KA	JL	1" = 2000'
DATE: 11/01		SHEET	

## **APPENDIX E**

**INFORMATION AS CONTAINED IN THE  
NATIONAL INVENTORY OF DAMS**

**NOT AVAILABLE AT THIS TIME**

END

FILMED

9-84

END